

**Science**

**Survey Title:** Public Survey for the 2018 Science Standards Draft











**Survey Properties:**

**Total Respondents:** 8837

**Responses By Question Analysis:**

**Organization, Content, and Rigor of the DRAFT Science Standards**

**1. County**

		<b>Response Total</b>	<b>Response Percent</b>
Apache		10	0%
Cochise		44	1%
Coconino		102	3%
Gila		11	0%
Graham		8	0%
Greenlee		4	0%
La Paz		0	0%
Maricopa		1876	62%
Mohave		26	1%
Navajo		16	1%
Pima		619	21%
Pinal		61	2%
Santa Cruz		8	0%
Yavapai		99	3%
Yuma		51	2%
Out of State		68	2%
<b>Total Respondents</b>		<b>3003</b>	<b>100%</b>

**2. Visitor Role**

		<b>Response Total</b>	<b>Response Percent</b>
K-12 Teacher		844	28%
K-12 Administrator		26	1%

K-12 Parent/Guardian		534	18%
K-12 Student		7	0%
Higher Education		226	8%
Retired Educator		240	8%
Business Representative		36	1%
Community Member		848	28%
Elected Official		9	0%
Media		4	0%
Other		229	8%
<b>Total Respondents</b>		<b>3003</b>	<b>100%</b>

**3.** If you are affiliated with a school, what grade level(s) do you represent? (Select all that apply.)

		Response Total	Response Percent
K-2		367	12%
3-5		429	14%
6-8		552	18%
9-12		518	17%
Higher education		367	12%
N/A		1378	46%
<b>Total Respondents</b>		<b>3002</b>	

**4.** If you are affiliated with a school, what type of school do you represent?

		Response Total	Response Percent
District/public		1413	47%
Charter		126	4%
Private/parochial		52	2%
Home		20	1%
N/A		1456	49%
<b>Total Respondents</b>		<b>3002</b>	

**5.** The Science Standards are well-organized and easy to read.

		Response Total	Response Percent
Strongly Agree		172	11%
Agree		837	55%
Disagree		282	19%
Strongly Disagree		232	15%
<b>Total Respondents</b>		<b>1523</b>	<b>100%</b>

**6.** Please comment about the organization of the Science Standards.

1. The Science Standards are organized but it seems that the state is removing chemistry classes and physics classes to create one chem/phy class.

2. I like the way they're connected to other standards in an easy-to-read chart.
3. Perfect
4. No comment.
5. n/a
6. The organization of the standards are easy to read. Looking at the essential vs plus standards for high school. I believe the organization between what is essential and what is a Plus standard may need some adjustment
7. Standards are organized. I don't agree with grade level choice for certain standards.
8. Too Many columns. Why are there the key concepts? This is not what was sent to ADE at the end of revisions  
I think this reorganization is detrimental to the education of middle school science. The way in which these standards has been grouped not only goes against the old standards but the current next generation science standards, by choosing to ignore both and create your own mess of a plan it is going to cause student gaps in science content knowledge and ultimately be yet another barrier that Arizona students are going to have to overcome. If you are going to rearrange the standards either organize them based on life, physical, earth or follow the guide of the next generation science standards, and states that have successfully implemented the standards ranking high educationally.
9. They are easier to read and understand than the previous standards.
10. I like the break down of affiliated terms with each topic. I would like to see resource suggestions.
11. The connection to student initiated higher thinking is great.
12. The organizational table made it easy to read each standard.  
These are so similar to the NGSS standards. I can not understand why Arizona funds such costly practices as rewriting CC and NGSS standards, rather than just adopt a well researched, national standard set.
13. I like how it is organized by grade level and what the main focus is.
14. The standards are organized in a way that is easy to read and understand.
15. I would like to see an inclusion that pushes the biological facts of there being only 2 genders. Male and female.
16. Ok
17. When giving examples of the specific topics covered in a standard, the examples should be spelled out and include the grades that they were introduced. The examples should not refer you to the standards for the grade where the topic was introduced.
18. They are organized fine but they are so broad and can be interpreted in many different ways. It's hard to know exactly what the standard is looking for
19. I like how it is broken into different types of sciences. However, I feel like there could be more explanation in some.
20. I like how you have the Key Concepts and how you can see where the scaffolding was taught previously. Could there be a little more detail for some of them instead of "refer to standard" I'm assuming that means it's pretty open ended, but not sure.
21. Wording of the standards are still a bit confusing.
22. The use of charts is very helpful, as is the "focus" statement at the beginning of each grade level.
23. Occasionally redundant.
24. I very much so like how the standards are divided by grade level and then we are given a breakdown of how the standards connect in the Distribution Chart (I looked only at K-2).
25. I like how they are detailed and even provide key concepts
26. Would like to have seen more detail
27. Doesn't quite explain how the standards go together
28. Sixth grade should be life Science, Seventh grade - Earth and Space Science, Eighth grade- Physical

- science.
31. I am a kindergarten teacher and these standards make more sense than previous ones. They are much more age appropriate.
  32. na
  33. I like the structure of the standards and feel that they will be easy for teachers to follow and understand.
  34. They leave a lot of room for interpretation. They also do not allow for teachers to implement unit based instruction.
  35. Very general and much of the content in a grade level seems random and unrelated making it difficult to teach units. Prerequisites for standards are missing. Ex. Seismology is taught in the 8th grade, but nothing else about earthquakes.
  36. i do not think that some of the new standards are vague and lead to interpatation.
  37. They were difficult to read and so broad they do not indicate what is expected to be taught.
  38. They are very broad
  39. The sections describing links between standards and other academic disciplines are wordy and not particularly useful in their current format. They would be of more use where the unnecessary "key concepts" section is currently located.
  40. We should restore the ASE (Association for Science Education) standards description of evolution because it is scientifically accurate and appropriate.
  41. No major issues
  42. I think they should be listed in a different order. Cells and organisms (elements & macromolecules of living organisms) should come first, then genetics, evolution, & ecosystems.
  43. They're fine
  44. No organizational scheme with please everyone all of the time, but it was easy to read and find information.
  45. I like the overall organization of the Science Standards, but having been on the committee originally responsible for the draft, I am confused by the appearance of the "Key Concepts" section. It was specifically stated that we were to avoid performance objectives because that encouraged teachers to use the standards like a checklist, rather than making bigger connections between the ideas. Including key concepts seems to undermine this idea. Were these added by the committee as a whole at the final committee meeting? These did not exist at the second to last meeting (the last time I was present).
  46. I don't feel like the standards flow in a way that would allow deep thinking and mastery of concepts.
  47. Easy to read. Please include exact vocabulary required.
  48. Organization is fine.
  49. Vertical alignment is presented well, along with cross-curricular references into ELA and Math for high school alignment as well.
  50. The Science Standards are written in a way that is specific rather than vague which makes it easier to teach directly to the standard.
  51. The addition of three dimensional learning and cross cutting concepts are a great way to help students get a deep understanding of scientific concepts.
  52. The organization is good and easy to access.
  53. The standards are more specific and easy to implement.
  54. Difficult to understand
  55. Earth and Space jump around
  56. Middle school students should explore one are of science in depth. Everything in science builds on something done previously. For instance, introducing atomic structure in fifth grade and then waiting until 8th grade to combine atoms, leaves too much time for students to forget the structure. Each science BUILDS. Allowing students to have the time to explore a subject in depth will allow for retention.
  57. Satandards seem out of place and not well aligned. Cause and effect as a main category to teach



does not make sense and will leave your teachers scrambling to make sense of that standard and how to teach it. Its too vague. IT looks like all you did was shuffle a few 7th grade standards to 6 grade and few of 8th grade to 7th.. The problem with this is, and especially for 8th grade, the standards you moved are vital to get students ready for HS. YOu took physics out of the question and students need it in 8thfor HS. Dropping it to 7th and not having an adequate replacement is not good enough. It has been replaced with Waves. Waves is such a minor concept that it just dont make sense on why you would teach that at 8th grade. Waves can be taught in 7th grade. Teache hin on Standards of geological rock column in \*th grade is out of place since 7th grade teaches about Earth history. You also chopped out anything about the periodic table that is needed for HS.

I very much like the hierarchical left to right arrangement.

58. I initially though that the "breadth of content" was lacking because several concepts did not appear represented in the left-hand broad descriptions, but they do show up in the right-hand detailed descriptions. The wording of the broad categories should be clarified to avoid this.
59. I feel verbage is not consistent in areas of key concepts
60. Easy to understand if one is familiar with NGSS. PD will need to be provided on how to read and use standards in planning lessons.
61. Excellent overview of the crosscutting concepts, practices & core ideas/3D learning. Appreciated the appendix to refer to for more indepth investigation.
62. There is so little left of the current standards. Things have been moved or deleted. What happened to the Next Generation Science Standards?
63. I hope it includes specific vocabulary that should be used in each standard.
64. Overall, they are good and developmental appropriate.
65. I like that they are organized into grade level groups. It makes it easier to see the changes and the progression from one grade level to the next. I know it's bulky, but it would also be nice to see a document that tracks each standard from K to 12.
66. I have strong reservations regarding the "key concepts" columns. These refer to the content taught, and limit how the standard can be applied. Even though it says "include but not limited to" teachers and parents still may see this as a list of content required to master the standard. If they are truely meant to be suggestions on how to apply the standard, they should be in a completely separate document. This could be developed by PLC's or districts in the form of curriculum maps etc.
67. The codes make sense and include a "using" standard in each
68. The standards are easy to read and understand from one grade level to another. The coding of the standards are understandable.
69. The standards organized in a table format make it was to read, but the mass amount of intruductory information make it hard to follow and make connections between grade levels.
70. I like how the areas are organized into the 3 sciences. It is great that the core ideas for knowing and the core ideas for using science are embedded through out the standards.
71. The standards are organized in a way that makes them easy to read. The wording of the standards is not clear as to what should be taught.
72. Organized in a readable manner
73. The Standards are easy to read, I like how they were grouped by type of Science. The grouping was similar across grade levels, so the consistency is wonderful!
74. They are not well-written and many of them still require much interpretation. The standards are randomized and completely unorganized over middle school grade levels.
75. The standards for my specific grade level are easy to read, but leave a lot of questions about what content to cover. The inclusion of the 3d idea of crosscutting concepts, core ideas and science and engineering practices created a beautiful theory, but I feel like it is difficult to know what that will look like in the classroom.
76. Standards are concise, articulation both above and below makes sense, like the 3-D visual model but it needs more explanation (titles, arrows), needs to be more user friendly, how to use it to make connections. Under the key concepts section, when it refers to concepts taught in previous grade levels in relationship to that standard, is the purpose for review, re-teach, or just for awareness that the groundwork was laid? Clarification is needed.
77. Overall, they are good and developmental appropriate.
78. Look at 3Us..P2U1.1. Key concepts suggest including 1.P2U1.1. Teacher must look back to 1st grade.

- Once there, key concepts suggest knowing K.P2.1. A teacher would need to double jump into 2 grade level to fully understand the intentions of 3rd grade.
79. The standards should make sense both from a level of knowledge aspect as well as a flow perspective.  
I enjoy that there essential and + standards.
  80. It doesn't make sense however to put the discipline area in the physical science standards. Things like energy and waves may fit in both and not necessarily contained in Chem or Physics.
  81. There seems to be a good flow and the standards seem to build on each other.
  82. On page 47- the front introduction of the High school standards, there should be a discussion of the four disciplines (Earth and Space, Biology, Physics, and Chemistry. )  
The coding is a bit confusing. Without using the key at the top a code such as 2.P1U2.1 is hard to understand. I know it's 2nd grade, Physical Science (P), and it's the first one of 8 (because of the 1 at the end), but the "1U2" in the middle just makes for a lot.
  83. They were very easy to read.
  84. These are not what the committee created
  85. They do not address the number of days required to teach the standards, only the number of hours per day they should be taught.
  86. The key concepts are easier to understand
  87. Organization is very clear, however the numbering system needs clarity.
  88. Standards are easy to look at it, but they are not necessarily easy to understand.
  89. The layout of the standards are easy to read and follow through.
  90. They are broken down into a format that is easier to understand.
  91. The standards are easy to read and understand. I would like to see links that enable further explanations and examples.
  92. I like how it's split by content
  93. The standards are presented in a way that is easy to understand. More details could be provided.
  94. K standards for science are foundational and can be taught in a developmentally appropriate scope.
  95. I would like to see a better layout of the standards.
  96. Once I understood the system, it was a mirror of reading ELA standards and easier.
  97. There are a lot of categories.. It might be more manageable if we made the categories more broad.  
It is so general, as a teacher I am not sure what I am supposed to be doing with it. Each district will be unwrapping it differently with different expectations. How will I know what will be assessed since it is so general? I am guessing what is included.
  98. That's good. Seems to proceed in an orderly, sequential fashion.
  99. The standards are easy to read. Key concepts are questionable on several standards or of no help in teaching. Standards need to have more details on what specifically students are being asked to know.
  100. They are easy to navigate with the coding, the color differentiation between science domains, and the inquiry standards being intertwined.  
The links under "Key concepts include but are not limited to:" to are helpful, but "refer to standard" is not. Does it mean the old Arizona State Standard? Is there a list of standards somewhere that I am missing? Or its just up to my interpretation of the standard what should be included?
  101. The key concepts seem to be more of a vocabulary list and not concepts. Some of these key concepts are highly inappropriate for the grade level listed and unrelated to the standard it was attached to.  
Some standards seem inappropriate for grade level and the "Key Concepts" are not actually concepts.
  102. They appear more as a list of vocabulary associated with the standards. This makes the standard seem irrelevant and confusing.
  103. I agree. I can read them and understand what is included, even if I do not agree with what is included.
  - 104.

107. Easy to follow
108. The high school standards are easy to understand and allow for cross cutting ideas when teaching.
109. With the exception of the Key Concepts column that was added by ADE, the organization seems to work fine.  
I found it really easy to navigate through the document and to understand standards. I also really like
110. the embedded hyperlinks within the document to bring you to other standards that were referenced within a standard.
111. The science standards are clear and easy to read.
112. Very easy to read. I can see the asking of students to critical think. My concerns how testing will take place for 8th grade. They can't use the current 8th grade state standard. Does not fit.
113. I like the way that standards are shown based on the last time that they were taught and how you can go back to the grade level where they were taught to determine what it was that was taught.
114. Well done on the organization
- I do not believe the 7th grade standards should include physical science standards. They should continue to focus on Earth and Space. 7th grade students are not ready to learn about inertia and forces. 8th graders struggled with the concept. 7th graders do not learn about moving variables, so learning about  $f=ma$  would be difficult to understand for them. The AZMerit has around 30% on
115. physical science, so they should continue to focus mainly on this in their 8th grade year, which will be a better transition for high school.  
The Earth and Space standards in 8th grade are oddly placed with the rest of the standards and does not flow well.
116. The distribution of the standards visual (chart) is very helpful and explains the standards very well.  
Some of the standards are too broad an I am confused as to what 8th grade will be responsible to
117. teach in order to have a successful testing session.  
There are parts that are explicit.
118. They are far too complicated. They remind me of the ILLP standards. Why does the state feel the need to overcomplicate rather than simplify things.
119. I think that organization is appropriate and easy to follow.
120. The integration of content from other previous grade level standards should mention whether correlating math standards will be taught as well.
121. yes organized
122. I like the big ideas
- Our team thought that the organization allows them to be navigated through easily, but the
123. connection between "Development and use in the model" and "key concepts need to be elaborated on more.  
Easy to read and understand general concepts, but very broad and lacking specific objectives and terminology students will be expected to master. How well are these standards aligned to future
124. standardized science tests (AIMS, AZMerit)? Because of the vast changes in the sequence of concepts/topics, I am concerned that there will be huge gaps in transition from the old standards to the new.
125. It is organized, but it does not seem like 40 minutes per day is possible with this being a computer science school.  
The standards for science is limited and similar to what we already teach. However, 40 minutes a day is not realistic in today's classroom, where we teach math for 90 minutes, ELA for 60-90 minutes,
126. Computer Science for 30-60 minutes a day as well. This does not include classes like PE, Music, and Art.
127. You are also assuming that the younger grades are teaching at least 60 minutes everyday of science. Which we know is not the case. So who will take up the slack?
128. They are well organized.
129. I like the general organization of the standards. I think it is helpful to divide science into 3 general categories.
130. Key concepts should not be hyperlinked, but explicitly stated so standards can be printed out and easily accessed by teachers.
131. The standards are easy to read and clear.

- There is the potential misalignment, both vertically and with respect to the 14 core ideas, resulting from internal, non-vetted changes to the standards statements. Reviewing the document, we have noted that, in both Kindergarten and 3rd grade physical science standards, statement changes shift the standards' focus from physical science to life science, resulting in the physical science import being lost. These changes break the learning progressions of the core content as well as vertical alignment between grade levels. It is possible that other significant alignment issues may be present yet not recognized.
132. the standards' focus from physical science to life science, resulting in the physical science import being lost. These changes break the learning progressions of the core content as well as vertical alignment between grade levels. It is possible that other significant alignment issues may be present yet not recognized.
133. The organization is fine, but the organization of the content itself is not.
134. Organization is easy to read, can be searched to find key words.
- As Director of a clinical laboratory, having a dual major BS degree in both Chemistry and Biology, I would like to see Arizona adopt the Next Gen Science Standards that are already in use in many states. We need to inspire our young people (especially female students) to consider STEM careers.
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136. Much easier to read than previous standards
137. Easy to read yes, but too complicated!! The coding system is a mouthful by itself.
138. Really well organized
139. The Original standards has a sequential flow.
140. They are easy to read and understand.
141. A lot more simple and easy to read. Kid friendly
142. It is very organized and easy to read
- They are easier to read because of the Key Concepts. Without the key concepts its hard to understand ideas as to what we are suppose to teach to our students. The key concepts helps give me ideas as to where to go with my students education.
143. They are easier to read because of the Key Concepts. Without the key concepts its hard to understand ideas as to what we are suppose to teach to our students. The key concepts helps give me ideas as to where to go with my students education.
144. The Ideas don't seem new but more complicated.
- They are easy to read due to having the key concepts written in. If you don't keep in the key concepts there will be way too much inconsistency between grade levels, schools, districts. All teachers need to be teaching the same key concept and not keep it just a broad concept.
145. They are easy to read due to having the key concepts written in. If you don't keep in the key concepts there will be way too much inconsistency between grade levels, schools, districts. All teachers need to be teaching the same key concept and not keep it just a broad concept.
146. The diagram is clear and easy to follow.
147. It is user friendly and I like the key concept portion that gives actual examples of what the standard entails. It would be more comprehensible if visual examples were included.
- The standards feel too broad for me to completely absorb them at this point. In previous years in reviewing other standards, specific example were given for types of activities or questions that we would do with the students, thereby clarifying exactly what we are expected to teach. These feel more broad-based and I fear I may not translate them correctly.
148. The standards feel too broad for me to completely absorb them at this point. In previous years in reviewing other standards, specific example were given for types of activities or questions that we would do with the students, thereby clarifying exactly what we are expected to teach. These feel more broad-based and I fear I may not translate them correctly.
149. I do agree that it is visually pleasing and easy to read, however, I do feel that the "Big Ideas" might be difficult to teach and interpret across grade levels for appropriate scaffolding.
- Where is the connection between each sub-category  
-What is the Big Idea? Unit/overall theme is unclear  
-Some of the sub-categories appear random
150. -Where is the connection between each sub-category  
-What is the Big Idea? Unit/overall theme is unclear  
-Some of the sub-categories appear random
151. The 14 core ideas and that they're the same for all grade levels.
152. Like the 14 core ideas behind the science itself and they are the same for all grade levels.
153. Easy to read.
- The presence of key concepts makes is confusing: are those the performance objectives? I thought this was just about standards, not performance objectives. I think these should be eliminated. They were not in the original version of the standards.
154. The presence of key concepts makes is confusing: are those the performance objectives? I thought this was just about standards, not performance objectives. I think these should be eliminated. They were not in the original version of the standards.
- It is also confusing as to where the standard number originates, in the individual grade levels...they are numbered sequentially from physical science, through Earth and Space and on to Life sciences...this is a bit confusing.
155. The standards profess to outline what the students need to "know, understand and do" by the time they complete high school, and at the same time they then provide of 37 standards, none of which say anything about what the student needs to 'know, understand or do' to be proficient at that standard. Rather the standards are about "constructing, engaging, evaluating, developing, etc." So,

because a student can construct a model of something does that mean they know and understand what the model represents? And just curious given the length of the standards, are the teachers actually going to read them...or are they going to wait for someone to provide them with materials to use in the classroom? Seems like a lot of time and money has been spent on creating a document that can't be used directly by a teacher in their classroom.

156. Standards are easy to read.

The actual standards are well organized and easy to read. The document itself has some very confusing sections, especially the connections to other academic disciplines (not well connected) and the Key concepts. The addition of the Key Concepts column does not meet accessibility requirements.

157. Placing the coding for each standard in a table cell makes it difficult for districts to capture coding and text of the standards without a lot of reformatting. Please make the document accessible and more user friendly for districts by eliminating the tables. Also, I'm unclear of the color coding. Core ideas are colored yellow/orange but so is physical science. SEPs are color coded blue but so is earth science. Crosscutting concepts are color coded green but so is life science. Is there a reason for using these colors in two different ways? This is very confusing.

158. The document is too long and repetitive. Trying to go over it in a reasonable length of time is very stressful. There seems to be a lot of jargon. When I studied science in Arizona, we weren't subjected to any of that. This really looks like Common Core in some ways, and Common Core needs to be repudiated.

159. I like the grade level organization

160. The Board of Education's Internal Review of the Standards does not take into account the flow of strands from grade level to grade level. This continuity was in the original standards created by the committee of professionals before Diane Douglas took them for internal review.

161. The standards themselves are organized well but the connection to other academic disciplines does not make sense.

162. The graphic models of cross cutting are too cumbersome and dis-jointed.

163. The first section that describes the standards and 3-dimensional learning is done well. The standards are written and organized in a coherent manner. The piece that leads to confusion and inaccurate science are the key concepts, which in what I know about concepts are not even concepts but vocabulary words that may or may not align to the standard. I would like to see these gone....

164. Key concepts need to be removed as they are not concepts but rather vocabulary and often not even related to the standard. Additionally, it clearly states that the job of the Arizona Department of Education is to write standards NOT curriculum. The "key concepts" are the job of the school district and classroom teacher.

165. Pretty straight forward on the majority...some strands I question and wonder exactly what we are supposed to teach.

166. organization is fine

167. key concepts

168. The standards are organized fine. I am wondering if we will be given a curriculum to use so that I can teach these new standards?

169. I would go Life, Earth, then Physical

170. They are easily understood.

171. Grade level content should be aligned with NGSS.

172. These are well organized but sometimes repetitive

173. I am not happy with the changes made by Superintendent Douglas.

174. Some Earth science topics (HS) students coming into high school may not have prior knowledge to build on.

175. They're okay

176. N/A

177. Were better before the 'green' areas added by the BOE. Let actual scientists and science teachers write the standards, not bureaucrats and laymen.

178. Organization is fine.

179. It is confusing for those reading it when looking at what needs to be learned over the course of a science curriculum rather than individual courses (i.e. biology vs. chemistry).
180. I was able to read this nonsense fairly easy.
181. They are not scientifically accurate
182. I like the order of which they are presented and that there are fewer standards to cover to focus on mastery.
183. Why on earth have you removed references to evolution and the big bang theory???
184. I like that they are similar to NGSS.
185. Nothing special but the order and organization will work.
186. The draft of the new standards are extremely watered down and less clear as to the learning goal required of each standard.
187. The National science education standard are better.
188. They are easy enough to follow
189. They are easy to read - i appreciate how they are segmented by sub-discipline  
The physical layout of the standards is efficient and easy to read, however I have an issue with the key concepts column. I am an 8th grade teacher, and I will use 8.P4U1.4 as an example. The key concepts say "Concepts taught in 7.E1U2.4 and wavelength, amplitude, speed, frequency." If I go back to 7.E1U2.4, it tells me "Concepts taught in 6.E1U1.6 and hydrologic cycle..." So then I again have to go further back to 6.E1U1.6 just to read "Extension of those taught in 4.P4U2.1, 4.E1U1.5." So AGAIN I have to dig deeper just to find out what I'm teaching in that 8th grade standard. I find this tedious and unnecessary. I understand that the standards are supposed to build off of each other, however it is frustrating to have to continue to search for the concepts. If the concept would be listed next to the standard from the previous grade level(s) I think it would be much easier for teachers to deal with.
190. So AGAIN I have to dig deeper just to find out what I'm teaching in that 8th grade standard. I find this tedious and unnecessary. I understand that the standards are supposed to build off of each other, however it is frustrating to have to continue to search for the concepts. If the concept would be listed next to the standard from the previous grade level(s) I think it would be much easier for teachers to deal with.
191. No comments  
There is no mention of the scientifically accepted concepts of evolution or natural selection. These are
192. core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.
193. Easy to follow and understand
194. I find Concept Maps confusing and not to the point. Often created to make people look like they have been working when in fact they are just recycling old stuff.
195. I do not understand the purpose of the far right column, especially when it says, "Refer to Standard."
196. The standards are vague in some cases and are left open to interpretation.
197. I think it is well organized
198. I like the organization
199. Without the input and additions from the state, the science standards lack structure and coherence.
200. The Core vs Plus set up is not very easy to read. I think it would be better to have them separate like they do in the math standards.  
They are very confusing and hard to navigate. When I first viewed the standards, I was very lost and not able to understand the standards due to the lack of organization. The standards should be
201. straight-forward and organized in a way that a parent, student, and teacher (both new teacher and experienced teacher) could access and understand how they are formatted. Instead, I found myself having to search for content and look for certain pages to access material.
202. I can easily read the standards.
203. I believe we need more time when talking about Newtons three laws of motion.
204. a bit repetitive, but acceptable
205. wordy and unnecessarily difficult to search
206. Organization seems fair although matching better to what is used at University level, using terms like



- applied mathematics and physics would be beneficial for continuity.
207. Written in a more passive voice than previously. Directness is always better.
208. Organization is important, but content more so.  
The key concepts do not correctly refer to the science standards. The key concepts distract from the main points in the standards and add too much incorrectly placed terminology for students to have to memorize.
209.  
One of the issues that we have in our current standards, is the 2-3 year gaps between touching base on certain concepts. I still see this issue in the new draft, I was hoping that issue would be resolved.  
The science standards are not organized well. Concepts have been moved to lower grades that are not developmentally appropriate. For example, atoms in 6th grade have been moved from 8th grade along with matter and physical properties. 8th grade students struggle with these concepts. In addition, the periodic table is taught in 5th grade and then not mentioned again until high school so teaching atoms in 6th grade and atomic bonding in 8th grade are out of context without the periodic table of elements.
- 210.
211. The proposed science standards with the added key concepts do not articulate well. Many ideas that are introduced in early elementary school are too difficult for these young children to conceptualize.
212. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
- 213.
214. It is good that they are separated and color-coded by strand. However, I do not like the naming system. I think it would be best to just include a letter to represent the strand (i.e. P for physical science, L for life science), than to try to incorporate multiple core ideas into the name.
215. The three dimensional nature of the organization allows for some confusion, especially U2. Perhaps it would be better to leave out the core ideas and just list the standards.
216. Its fine.
217. The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.
218. They are organized fine
219. The proposed edits make the standards much less clear. Please use the standards that were submitted, prior to the edits.
220. Very concerned about evolution not being talked about. The 1st amendment is being trampled. The Establishment Clause is being flaunted.
221. It's fine.
222. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
223. I can read them and understand them clearly.
224. "Theory" needs to be defined in scientific context  
Organized by grade level and able to follow, although many of the edits add more ambiguity and detract from the scientific concepts to be taught. Also an issue with disciplines skipping years, or multiple years as seen with concepts in physical science and life science bands in middle school.
- 225.
226. Generally OK
227. Organization is fine
228. Well laid out with color coding is easy to follow and read
229. Downplaying the FACTS of EVOLUTION is not "science." It is not your job to advance the religious nonsense pushed by the AZ Republican Party. Your job is to make certain FACTS and SCIENCE are

taught throughout AZ's PUBLIC schools. Parents who are made sad by science & facts may place their children in PRIVATE, religious schools.

230. A table of contents or other organizational tool at the beginning would be helpful.

These standards are not written in an easily understandable way. I don't feel that they are organized by a "unit of study". It would be better if they were more specific and less general. I understand the idea of being "broad" as to lend itself better to more in-depth study, but I don't feel that these provide enough direction.

231. For example, this standard: Obtain and evaluate information regarding how scientists use technology to identify substances based on unique physical and chemical properties.

My question: What is meant by "technology"? Would this be what students would be utilizing in the process of doing a lab to identify substances? Such as laboratory tools?

232. I would like to see the standards first, followed by the overall explanation.

233. There should be more content per p.o

234. Organization is adequate to convey information.

235. Keep Diane Douglas out of this process!

236. The standards as presented do not have a foundation base, and leave behind many students.

237. Like the listing of the key concepts. How the Distribution of the standards are broken out and connected together.

238. Well organized

I would prefer the standards acknowledge the scientifically accepted theory that all things evolve. The use of the word "evolution" is not a bad thing. Religious extremism does not belong in science standards.

240. Easy to read

241. You are taking out requirements for evolution. This is absolutely necessary to be required learning in science.

While I do appreciate the connections drawn between grade levels, I think all of the "5.P2U1.3" type verbiage all over makes them hard to decipher. Teachers would have to keep several grade bands of standards available in order to figure out where exactly they need to begin and end their instruction based on prior knowledge that "should" have been acquired and not step of the toes of future instruction.

242. Also landscape with 1" margins doesn't provide for a reasonable use of space. The middle grades standards could easily fit on 2 pages (which could be copied front and back) to allow for easier referencing. #earthfriendly

I am also very concerned about what the testing for these standards will look like in a "grade band" scenario the tested grade teacher will be responsible for filling multiple years of gaps and teach their own content.

243. I am confused by the "knowing and using science" as "big ideas". It would be far better to use the science and engineering practices, cross cutting concepts, and disciplinary core ideas that the rest of the country is using. These came from "A Framework for K-12 Science Education", a document upon which the AZ draft science standards are supposedly based upon. Further, the key concepts are NOT concepts. They are a vocabulary list. This defeats the intent of the new vision for science education to have deeper, richer conceptual understanding.

HS+C.P1U4.8 and all Physical Science Plus (+) Standards. We do not have materials to teach all this standards so that it will be engaging to students. If the Department of education will provide science kits that will address all this standards then we will be willing to teach it and engage our students well or else Physics class will be boring and hard with Physics with just mathematical calculations... I would like to see Physics as more applicable to daily lives of students and they can really apply it in

244. their house and etc. As of now, my focus are topics like Motion and Forces, Energy Conservation, and electricity. Also, there too many Physical Science Standards ( Physics ) compare to Chemistry. Chemistry essential = 4 and plus= 9 total of 13 only, then Physics has essential 6 and plus = 13 total of 19.... why there are too much of the Physics. Hopefully all students are being considered too and not only A schools, our students needs still basic mathematics and it's hard to teach hard topics like magnetism with them. Although I am trying to engage them with everything that I can....



245. Evolution is more than a theory, so believe "the theory of" should be edited out  
I am thinking in terms of content and cannot get pass the glaring mistakes. Magnetic field, evolution...terms that are completely acceptable and agreed upon by the scientific community and
246. that are missing from this draft. I for one do not want my children growing and learning in a community that still calls Evolution a theory and opens the door to thinking the world is flat.
247. It looks nice but has major content issues.
248. Inaccuracies make them difficult to read.
249. As sent by the 111 science specialists in November 2017 (left unchanged).
250. No problem with the organization.
251. The changes are unacceptable.
252. Due to trying to downplay the role that evolution has in Science, the standards are worded weirdly and are harder to understand.  
I think you should keep some of the original explanations for the Space Science for the HS. E2U2.17
253. Also, the 8th Grade and High School changes are unacceptable. Specifically, changes to some of the vocabulary words. How this gets rid of words such as evolve, big bang theory, and etc.
254. The standards do not use the language of scientists. Important words have been changed and will negatively affect the learning of our kids.
255. The removal of vital information shows that these new science standards are NOT well-organized.
256. Needs to go back to review.
257. You need to review this
258. It needs to go back to review.  
There are strands mentioned on the connections to other academic disciplines, but I can't find an
259. explanation of the strands or how they fit into the overall framework of the standards. The previous standards listed the strand, then the concept and were much easier to follow.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better
260. understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution.
261. The original draft was great before the unscientific edits.
262. Needs review  
The constant "refer to standard" and references back to other grade levels is unclear and convoluted.
263. State the standard and what key concepts need to be taught. Teachers need guidelines not word searches.
264. not perfect but ok.
265. Much better now!
266. These science standards are not developmentally appropriate for children. Gwnwtics in 5th grade is insane!
267. I can read them.  
The organization of this draft seems appropriate. My comments have more to do with content in some
268. areas. I am currently a professor at Northwestern University (Evanston, IL) and a research scientist at the Chicago Botanic Garden. I received my PhD from the University of Arizona in the department of Ecology and Evolutionary Biology.
269. I am commenting on the DRAFT Science Standards from the Committee NOT as amended by the the ADE staff and Superintendent!
270. The organization of the science standards is acceptable.
271. I't missing some key components.
272. I have not read the full draft, so have no comment on this

273. Organization is fine for each grade level.
274. Evolution is central to all of Biology and must be included in the science standards because biology only makes sense in light of evolution.
275. The wording is difficult to understand for some of the standards.
276. It is organized into an understandable format.
277. No, I found them to be confusing, leaving a lot of room for interpretation.  
High School Standards: The high school standards are confusing to understand the difference between essential and plus standards. Possible solutions: reference page of how the essential standards and/or plus standards align to current courses that schools have; indicate that essential standards are the tested standards; Make one table (column for both) bolding or highlighting the tested standards (standards for all students).  
Key Term Column: Although this column contains lists of words that might be useful to a teacher, they do not assist the teacher in the practices or cross cutting concepts that should be integrated with that standard.
278. In addition, listing terms can be a "check-list" for teachers indicating that they taught the standard. Possible Solutions: Include the learning progressions from Framework and/or Working with Big Ideas of Science Education instead of terms; include the crosscutting concepts that align with that standard - this would indicate a 3-dimensional approach rather than the 2 dimensional approach that is currently indicated by the way the standards are written; Have that column as an appendix or a resource to the standards - other information could then be added such as info about the practices and new discoveries  
Science classes must include the scientific research published in high ranking peer-reviewed journals of CLIMATE CHANGE, EVOLUTION, and mechanisms of natural selection if students are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world.
279. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science courses such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
280. Organization is straight forward  
It is necessary for students to understand the process of science and to understand how new revelations in science, based on peer-reviewed data and interpretation, results in small yet significant changes in our understanding of how living and non-living matter change over time. Science uses language to express concepts that best fit the best available data. But science is much more than concept vocabulary. Science is an every changing understanding that refines our perception of and capacity to utilize matter and energy in numerous different functional processes. What is missing is the lack of the over-arching framework of science in which the major ideas come from the critical thinking of analyzing how the small pieces fit together to form the big pieces. The plan needs a comprehensive conceptual structure based upon the key ideas in science.
281. I do not understand why there are essential standards and then other standards, especially when the other standards need to be taught to achieve the essential standard.
282. They ramble on in some cases.
283. I wish you could just adopt the NGSS as other states have, there is no need to reinvent the wheel and this will make it challenging to find a strong curriculum.  
Only in an impending theocracy intelligentsia design' taught. It being less than a pseudo-science with no proof or empirical fact. I will not let the children of this state be taught,'at the discretion of some
284. teacher with no scientific background that adam and eve were the first humans and their mythological deity created a universe in 6 days. Why not just give them a lobotomy if you are going to teach what they do in the middle east. I our nation to become the equivalent of the taliban and the saudi's.
285. Fine
286. There simply is no organization when facts are removed in the standards.
287. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
288. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
289. Just ok
- 290.

291. Educational structure -- as long as the teachers/ admin can figure it out.
292. I appreciate the connections to other content areas. This is helpful to encourage interdisciplinary studies.  
Creationism is not science it has no place in these standards.
293. Evolution is the internationally accepted and scientifically provable Theory which belongs in these standards.
294. Science was organized in my time in CUSD
295. Creationism is not a valid scientific theory. Keep religion out of schools.
296. Based off the "general impressions of the organization, content, and rigor of this DRAFT, and recommendations to the State Board" There is nothing appropriate about what you are trying to do.
297. Send the standards back for review.
298. Intelligent Design does not belong in our science standards.  
Removing all references to Evolution is nothing but "conservative correctness" run wild.
299. Worse, endorsing "Intelligent Design" as "science" IS AN OUTRIGHT LIE! It is no more "science" than the belief the Earth is flat, or that it's the center of the universe. What's next, teaching the theory that disease is caused by witchcraft, or punishment from Apollo?
300. The Science standards are biased and not based on scientific knowns.
301. Science standards should teach science, not religion.
302. Evolution is science. If you remove it from the curriculum then you are no longer teaching science. You're putting the children of Arizona at a distinct, global disadvantage.  
Intelligent design is a front for 'creationism'.
303. Creationism is not science - It is an opinion with no connection to fact.  
Science is simply observation of data, while this 'creationism' is designed to fit a belief system.
304. I like the similarities between NGSS and the AZ science standards. The crosscutting concepts help them connect between grades and across topics.  
Efforts to Include creationism in a science based curriculum demonstrates a lack of understanding of the rigors the methodology applied within the scientific community. Creationism fails the evidence threshold and should take its rightful place within the realm of theology; science and religion are incompatible.
305. To say that evolution is "just a theory" demonstrates a gross misunderstanding of science. Biological evolution is not "just a theory", it is the most robustly demonstrated theory in all of science. By omitting this fundamental concept and achievement of the scientific method severely disadvantages the children of Arizona. They will not be able to compete with the jobs of tomorrow. Job in bio-science and medicine make money and cure diseases because they are founded on reality: the reality of evolution.
306. Do not let ideology or ignorance hold our future back. Put evolution back into the curriculum. Facts aren't ideology. Evolution is a fact. You test it every time you get a flu vaccine or eat food from plant and animals humans have changed and domesticated over the last 10,000+ years.  
  
Shame on Diane Douglas. Keep your religion out of our schools.  
I am only clicking "agree" here so that I can get to the part of the survey where I can comment on
307. the removal of certain items in the standards. I would say here that the teachers who put together the standards are opposed to what Diane Douglas has done here.  
Science Standards should include the study of evolution, an evidence-based model critical to the
308. understanding of biology and medicine. To be rigorous, the Standards must include evidence-based science.
309. The way the content is defined does not make sense to me
310. Evolution is critical to science.  
"Intelligent design" is a misnomer and had no place in science instruction.
311. Organization ignores proven theories of evolution.
312. Easy to follow.
313. Painful to read. Contains many grammatical errors making it difficult to comprehend.

314. They may be organised but are not based on true science and facts.
315. The standards are difficult to
316. Evolution happened, is happening, and will continue to happen. You are dumb-ing down our children by teaching them fake news.
317. Any well-organized Science Standards would not include creationism.
- I know a great deal about Charles Darwin and have published a book about how George Eliot and
318. other novelists responded to evolution. It is a travesty to turn the clock back to the age of the Scopes Trial!
319. Evolution is fact.
- I prefer the Next Generation Science Standards for organization, detail, and overall scientific content.
320. These draft science standards are a poor substitute for the Next Generation Science Standards. Maybe you should use those. They are based on the same books you claim to base these standards on, but the NGSS are much better.
321. Evolution needs to be included
322. The organization is easy to read. No changes necessary here.
- It is easy to see the relationship between the core and advanced standards. I like how there are two sets of standards; HOWEVER, by having two sets you are tracking students - which can be good or
323. bad. For me a long time experienced teacher, I can easily leap back and forth between the two. For new and young teachers, they will probably choose one track or another and leave out chances for enrichment.
324. keep your god out of our schools
325. Continue to teach evolution and not remove it to teach creationism
326. Evolution is an established scientific theory. Creationism/intelligent design is a fantasy. It has no basis in reality.
327. The standards are vague. The only thing that is scripted is what students should be able to know/do at the end of the each year. They are not that specific, nor do they give examples of activities, etc.
- The Science Standards, as initially drafted by knowledgeable Arizona science teachers, have been
328. edited under ADE to respond to political pressure and dilute the teaching of evolution, which is a foundational concept of life science and Earth science.
329. Poorly organized, appear to follow Next gen standards but fall short
330. Confusing, misleading, and unscientific language regarding the evolution and development of life on Earth. We need to rely on demonstrated science, not on a belief in what we want to be true.
- The standards are written as they have always been written. It is neither poorly written or well
331. written. A new teacher in Arizona should be able to read the standards, know the intended learning outcome, what common vocabulary is used, the overarching main concept and all of the concepts that would fall under that overarching main concept.
332. Confusing, misleading, and contradictory language regarding evolution.
- The removal of key science topics including Evolution and big Bang is wrong. A Theory is not just an
333. idea Here is the definition of a theory  
a coherent group of tested general propositions, commonly regarded as correct, that can be used as principles of explanation and prediction for a class of phenomena:  
Diane Douglas stated that evolution is just a "theory." That is a failed talking point of creationists. There is absolutely no evidence for any gods. That is a fact. If Douglas can provide verifiable facts that god exists, then he remains "just a theory." Evolution is one of the most important scientific theories of all time. The sequencing of the human genome is proof positive, if there was ever any
334. doubt, that evolution is a fact. At present, many teachers fear teaching evolution simply because they fear reprisals from students' parents. Evolution should be taught in all schools and without interference from religious zealots such as Douglas. These new standards are a joke, and they will set Arizona education back to the 1950s. Shameful!
- I am concerned that the phrase "science and engineering practices" has replaced the term "scientific method". I do not understand the rationale. Also, the separation of standards into essential and plus
335. isn't a bad idea, but students only receiving essential standards seem to be missing out on rather essential content such as natural selection.
336. Some standards are not scientific standards seem more like religious ones.

337. I feel that we SHOULD NOT SPRIAL earth concepts over the three years, this content is very boring and is not vital to the learning. I feel that the content currently in 8th grade should stay at the 8th grade level, except ecology concepts that should be moved down to 7th. Physics and chemistry content should stay in 8th grade as well as genetics.
338. obfuscating the meaning is contrary to all scientific evidence.
339. Creationism is not science but a religious belief. If evolution is not taught in schools, students will be lacking in fundamental knowledge of science. Bacteria are evolving and now are resistant to many antibiotics. This is because they are evolving. This is because of evolution. If students are not taught evolution in school Arizona students will be looked at as coming from an already flawed, underfunded education system we have here is Arizona.
340. Within the standards, they should be organized by core ideas instead of topics. It will help teachers see the connections between topics.
341. The organizational structure seems to comply with the next generation science standards, which is the standard by which they should be judged. <https://www.nextgenscience.org/>
342. organized.
- I find the older standards much easier to read, as they better identify how strands of knowledge or individual topics change and complement each other through the grade levels. Contrary to the claim of not prescribing curriculum, the new standards seem excessively detailed and don't make clear connections among topics or to other grade levels on the same topic.
343. The introduction pages (e.g. page 9 for K-2) describe core goals for each level that often don't quite match up with the individual standards described. E.g. 4th grade is supposedly about the role of the sun in providing energy, but that is the topic of individual standards for grade 3.
- For Summary table on page 20  
Why are there no examples for U3, knowledge produced by science is useful for products, in the life science standards? Plenty of examples to choose from, including communicable diseases, medical diagnoses and treatments, agriculture practices, food production and consumption.
344. I enjoy how standards are linked to previous grade level standards in the key concepts column. I feel the other information (vocabulary words and concepts) are a helpful addition; however, teachers must be explicitly told or trained to use this as a guide rather than just vocabulary. Boiling down the three dimensional learning idea into a vocabulary list would just be a giant waste of time.
345. There is no mention of Charles Darwin theory in the life science curriculum. Specifically there is no mention of evolution as he is currently excepted by 99.99% of the scientific community of this country
346. Science must include the scientific research published in high ranking peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class. Sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
347. Draft science standards need to be improved to encourage critical thinking and evaluation of the evidence relating to evolution. Your Core Idea L4 implies that evolution over "countless generations" is the only explanation for the origin and development of life. However, a large percentage of researchers in the Life Sciences community do not find evidence for this neo-Darwinian model of evolution taught in schools as assumed fact. Their findings need to be given equal weight in the interest of scholastic integrity and intellectual honesty.
348. The organization is not what I find fault with.
349. I do not understand eliminating references to evolution as a driving force for biological diversity. Evolution of plants, animals and humans over time are scientific facts and should be explored in detail by students.
350. Intelligence is missing from the section: processes by which a species may change over time due to environmental conditions.
351. May I see the new draft?
352. Organization by grade is adequate.

353. orderly  
In both Kindergarten and 3rd grade Physical Science Standards, statement changes shift the standards' focus from physical science to life science, resulting in the physical science import being lost. Changes to standards statements such as these break the learning progressions of the core content as well as vertical alignment between grade levels.
354. Takes us back to the dark ages.
355. TEACH EVOLUTION, NOT RELIGIOUS DOGMA
356. Comply with scientific fact, thoroughly.  
The content, should evolution be watered down by talks of "intelligent design theory " is alarming. Intelligent design is not scientifically accurate, and it only pushes unconstitutional religious indoctrination upon AZ students. I'm very disappointed Ms. Douglas thinks she can go against matters higher courts have already resolved. Any attempt to shoe-horn her personal beliefs into public policy should warrant an investigation into her "ability" to perform her duties. I know Ms. Douglas does not have a strong educational background, so we must continue to guide her in areas she is apparently ignorant.
357. They are not as easy to read as the next generation science standards. I find the key concepts very confusing.
358. Very organized, clarifies objectives better by being more specific
359. The organization makes it easy to follow.  
The Dept of Education's biases are evident in their revisions. Some are okay, but many are not acceptable. For example, evolution is not a theory any more than gravity, Earth's revolution around the Sun, and how babies are made are theories. The use of "positive and negative" effects throughout the document are also biased and should be removed.
360. difficult to clearly understand
361. There are several sections that do not belong. Primarily any inclusion of creationism is bogus hogwash and does not have any role in Science.
362. done by a buerecrat
363. They are comprehensive and data oriented.
364. The science standards for Arizona students should contain all relevant scientific theories.  
I am horrified that religious creationist garbage is being inserted into curriculum by a religious zealot.
365. We do not want to become more uneducated as a nation. Intelligent design has no place in a public school curriculum
366. Clear horizontal alignment charts showing each essential standard's progression from k-12 on one page would be helpful.  
The draft standards are much less detailed than those articulated in the common core curriculum within the Az-Merit program that Superintendent Douglas vowed to remove when she took office. They are easier to read but this is mainly because the content is often vague and poorly stated.
367. No issues.
368. I taught in AZ several years ago, the science standards are appropriate and well aligned to standards in most other states. It would be best if they were left as is.  
Please take this moron out of the decision making process, please quit being over sensitive and trying to change everything. We are turning today's children into cry babies, children with a sense of entitlement and we are doing them a disservice if this changes due to her beliefs/values.
369. Do not remove evolution. We should be teaching our children progress and science, not instilling the board's beliefs - school is NOT the place to do that.
370. Science should be organized and taught to founded and researchable theory... this was not.  
How do teachers feel about the organization of the science standards? They are the ones who will be responsible for teaching to the standards. Teachers should have the final say in the structure of the standards.
371. Too often refers to acronyms and "standards" not part of the document.
372. Adequate



379. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
380. Teaching creationism in school is an unconstitutional endorsement of religion in tax payer funded public schools. Any effort to introduce this into school curriculum will be met with strong opposition.
381. I do not understand why, in this day and age, there is removal of evolution in science. It's not a theory, it's as close to a fact as we can get.
382. The organization is fine. It's the content I have concerns about.
383. I do not know of any reason there should be any drastic changes made.
384. Include evolution and creationism isn't science since it cannot be shown through experimentation. Evolution can be tested so it should be taught.  
If the goal of organization was to illustrate how each standard could stand alone and be integrated into several sciences, the organization is more complex than it needs to be. Organizational categories should divide information in order to be able to use it. As it stands, standards are not appropriately connected to the science classes in which they traditionally belong. Taking into consideration the transition to 3D curriculum, different categories would better serve: 1) "Big Ideas"- larger cross concepts for all Sciences, 2)"General Science"- smaller pieces of content to break down those Big Ideas into separable and studiable parts, 3) Next, specific Science content, 4) Cross curricular concepts, 5) Skills, 6) Meta Ideas, 7) Technology & Engineering components  
EXAMPLE: EARTH & SPACE SCIENCE 1) Big Idea: All matter in the Universe is created from atoms
385. which interact to make the things around us, 2) Atomic Structure, Periodic Table, 3) Earth & Science curriculum specifically- protons, neutrons, electrons, nucleus, charge, 4) Structure and function cross curricular. After the Big Ideas are identified and curriculum science categories are determined, individual sciences can determine how they will specifically teach/use the curriculum in their course. This way, simply, many courses can teach Atomic Theory- not just Chemistry. This particular curriculum can be taught in Earth, Enviro, Biology, and Chemistry. The way the curriculum is written now it TOO complicated. It does not need to be so. Science Content is one of the pillars of 3D learning! You cannot leave out the "curriculum" part- which you put in later as the 'Key concepts" part! This is too disorganized! Allow each curriculum science course team to determine what should be in here. That way, Big Ideas can be used in many classes using course specific curriculum.
386. N/A  
The draft was easy to read and followed a pretty logical path from my experience of education.
387. Though some of the language seemed too open for interpretation around the evolution topic. We should work to ensure that real scientific research is used to teach our children what has been proven as a sound theory (near equivalent meaning as "fact" in science definitions).
388. It clarifies a few things.
389. The organization is easy to follow. The section on cross-curricular ties is important and will be useful.  
If Diane Douglas does not believe in evolution then Diane Douglas does not believe in science. She needs to turn in her cellphone and go back to the pony express, turn in her modern car and go back to a horse, turn off her GPS and use a map, turn off her air conditioner and start sweating and instead of flying to her next vacation destination, take a horse and buggy, and on and on. It is only the religious fringe elements who are trying to excise evolution and global warming, not the
390. mainstream of Arizona residents and residents of the United States and the world. If Arizona wants to attract technology companies to invest here, they will not do so by denying science. Remember this is PUBLIC education not RELIGIOUS education. If those of her ilk do not like science fine but they do not get to impose their minority view on the rest of us who do. The expression "tail wagging the dog" comes to mind. The purpose of education is to teach our children about the world around them as it actually is, not filtered through religious zealotry.  
They were easy to read until the Superintendent thought it was ok to impose her radical religious views and delete all mention of evolution in the life science sections. This is outrageous. Mainstream religions have no conflict with evolution. I was taught about evolution by the sisters of saint joseph in my first 12 years of catholic school! After that I aquired a BS in Biology from U Mass, an MS in
391. Population and Environmental Biology from UC Irvine, followed by a MA and PHD from Duke focused on Demography. I taught Demography, medical Sociology, and Aging (as well as a few other courses) for 36 years at ASU. I fear that my 7 grandchildren will be ill prepared for 21st century STEM jobs and the economic future of this state will be undermined by Douglas' imposition of her ignorant zealotry.
392. This conflates important scientific knowledge with unimportant opinions.

393. The organization makes logical sense to me.
394. They are satisfactory.
395. The standards should be re-formatted as performance objectives. They should be very well defined and specific in order for teachers to develop appropriate curriculum from them. The key concepts are too nebulous and leave too much up to interpretation. They should be omitted and instead have very clear specific performance objectives.
396. The organization mirrors the NGSS.
397. Need more emphasis on the lower grades content.
398. The Science Standards should ALWAYS be organized around SCIENCE and not politics/religion.
399. Science standards should encourage critical thinking and evaluation of the evidence relating to evolution.  
KEEP ALL religious beliefs out of the classroom. TEACH REAL SCIENCE based upon hundreds of years of research and peer reviewed studies. DO NOT ALLOW any so-called beliefs about a certain religious creation story that was first brought forth by people that didn't know where the sun went after setting. Please allow Arizona children to really learn science and be prepared for working in the 21st century.
400. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
401. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
402. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
403. Categories and subjects are arranged in an easy to use format.
404. Clearly laid out and organized.
405. As a science teacher, the standards were relatively understandable. However the wording is vague as far as the verbs for learning objectives.
406. Creationism should stay out of Science!!
407. I think we should be using a set of standards that reflect the Next Generation Science Standards.
408. Teach Evolution, not religion
409. The original structure, before internal review, of the standards presents information in a clear and detailed way with more of a focus on the goal of science rather than a checklist of skills.  
Diane Douglas made this difficult to read by misrepresenting evolution repeatedly as "a theory" and altering the language to be more religion-friendly. She is solely responsible for this, and not only does it not read well, it derails any semblance of organization of anything when one of the largest overarching principles of science is tossed aside like a used napkin.
410. The draft is well organized and precise.
411. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
412. I read the document and I cannot believe the wording regarding evolution has been deleted. This act is completely absurd and the people behind this change should either go to school and learn basic biology and the method of science.
413. New standards are not specific enough and are too open ended, particularly for first year and new teachers. Trainings should be administered from AZ Dept of Ed if they are to be taught correctly in my opinion.
414. The organization is easy to follow, however the reason behind why each standard was chosen for 7th grade science is not effectively represented.
415. A clear progression, and rigor of requirements is not obvious.
416. The linear format of the grade levels and what will be addressed is helpful. The standards are not measurable though. They allow the possibility of students to come out knowing nothing or something. Granted, standards act as an outline for the general purpose of the rest of the document. The document is redundant almost like someone copy and pasted each grade level and just changed a couple things. They are repetitive. I think a shorter format would be in order so that teachers felt like it was worth their time to read it.
- 417.



418. I find them somewhat hard to read, but am not sure there is a better approach
419. They repeated themselves a lot. There were spacing errors, and the grammar was not up to snuff.
420. Organization seems clear and well-laid out.
421. Evolution should be taught, clearly, in our schools. Anything otherwise is a violation of the separation of church and state.
422. I have no problem with the organization, but the actual standards concern me.
423. The standards are neatly organized but slanted inappropriately to favor religious opinion as equal to scientific process.
424. The content was presented in a logical manner  
Standards in general are challenging for a novice to follow. Arizona's original standards, and the current draft, are no exception. I have concerns that some of the topics are poorly defined, based on the intensity with which they should be included in the curriculum. Nevertheless, the standards are not unusually difficult to unpack.
425. In terms of improving the format, the single greatest recommendation I would make in this vein is to orient the formatting vertically, so it may be read in the ordinary manner. The frequent use of horizontal tables in many state standards (including both the original and draft standards) is puzzling and hinders legibility.
426. It's fine.
427. The standards are not written in language accessible to many parents; a college education seems required.
428. They should be collected more sensibly based on classes that are taught.  
There are a lot of sections. Some are the actual standards, some are instructional notes, some are concept notes. Please at least add a table of contents. Also please provide options to access standards by grade level as well as by Physical / Earth & Space / Life.
429. Regarding physical sciences, organization and ease of reading are fine, but that is not the problem.  
Alignment of core ideas across grade levels helps readers see how standards are connected and progress. Interesting choice to focus grade-levels on cross-cutting concepts. However, I would argue that since the cross-cutting concepts are exactly that, grade foci should not be limited to some concepts. For example, it is appropriate to see how patterns are relevant to content studied in all grades.
430. Please teach science
431. The organization seems appropriate in length and organization.
432. Attempting to sneak creationism in through the back door of a science curriculum is an affront to education.
433. They are well organized  
Please do not allow the instruction of Creationism/intelligent design in our K-12 schools, this is pure conjecture & not science. My future offspring deserve to learn the facts about evolution. Religion has no place in school, we will teach our children about religion on our time.
434. What is at the top of the illustration given? "Engage in argument thru evidence"  
That is a core ideology
435. It can't be organized if it is missing topics.
436. Stop trying to ignore, deny, erase scientific fact - evolution, from the curriculum.
437. I am concerned about the content.
438. No opinion on this.  
Get rid of all references of Intelligent Design. Return the term evolution and evolve to the standards.
439. Research the background influence of "Intelligent Design" and you will see that this does not belong in public education.
440. It was difficult to follow the connections between grades levels and how the learning progress from K-12

444. The '3-dimensions of science structure figure emphasizes the most ambiguous and general concept, "knowing science and using science," over the specifics of the standards. Furthermore, the figure makes no attempt to illustrate how each standard is linked, other than it relates in some way to "knowing and using science." Representations of models are more important than the text for communicating multi-dimensional concepts. This figure should show (1) what the standards are, (2) how standards interact, and (3) how each standard will be emphasized at each grade level.
445. Evolution is a fact. It is unconstitutional to inject religious beliefs in public school curriculum.
- With the exception of the key concepts column, there is a clear emphasis on using current science education research. The key concepts should be removed from this document; any extra supports should guide educator understanding of the standards in the context of the 3D Framework.
446. The key concepts detract from a focus on the standards. There is a need to improve the progression from grade level to grade level, ensuring that students are learning new content each year not re-learning concepts from previous years.
447. The physical structure of the document is user friendly and consistent in layout, but it is not laid out to support an understanding of the progression of the concepts addressed. "Key concepts to include section" is not helpful as they detract from the standards.
448. The document flows from topic to topic and is consistent. Unfortunately, the standards lack
449. I found it very easy to follow and understand.
450. Easy enough to read.
451. Less specific
452. They are worded with excessive unnecessary jargon. The essential information is difficult to interpret.
- The draft standards attempt to produce 3D learning, similar to how the NGSS intertwines cross-cutting concepts, disciplinary core ideas, and scientific practices. But there are two problems with the way that the draft AZ standards attempt to do this. First, the crosscutting concepts, disciplinary core ideas and scientific practices are not intertwined. Instead, practices and core ideas are merged and then clustered around cross-cutting concepts, which produces strange clumpings that at times seem forced and at other times leave out important connections across grade levels. For example, patterns are addressed in first grade and fifth grade, but not first, second, third, and fourth grade. As a cross-cutting concept, patterns should be made evident at all grade levels in all content areas. The second problem is the seemingly arbitrary merging of the practices and the core ideas. Why aren't the core ideas merged with all of the practices? It seems that students should learn how to ask questions, plan and conduct investigations, develop and use models, use mathematical and computational thinking, construct explanations, engage in arguments from evidence, and obtains, evaluate, and communicate information related to all of the core ideas. This last issue is a problem with the NGSS too.
453. The new standards generally follow the format of the Next Generation Science Standards, which are fairly well-organized. However, key factors are missing (see below).
454. I appreciate the organization that the committee put together.
455. Organization and readability are not what I am concerned about. It is the content that matters and the content of these standards is very concerning.
- I like to cross-cutting relationships and connection to other standards. The science and engineering practices are well done, similar to the 8 common core math practices. The fourteen big ideas are well formulated. It looks like you took information from various other standards and consolidated them well.
456. The organization of the standards follows the logical template of the Framework for K-12 Science Education.
457. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
- The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
458. ARIZONA STATE BOARD OF EDUCATION  
Regular Board Meeting, August 24, 2015  
1535 W. Jefferson, Conf Room 122, Phoenix, Arizona 85007  
SUMMARY OF BOARD ACTION  
MEMBERS PRESENT:

Dr. Crow  
Mr. Schmidt  
Superintendent Douglas  
Ms. Hamilton  
Mr. Taylor  
Dr. Rottweiler  
Mr. Carter  
Mr. Jacks  
Vice President Ballantyne  
President Miller MEMBERS ABSENT:  
Mr. Deschene

CALL TO ORDER, PLEDGE OF ALLEGIANCE, MOMENT OF SILENCE, AND ROLL CALL Meeting called to order at 9:00 am  
Pledge of Allegiance, Moment of Silence and  
Roll Call confirmed a quorum

Item 1A – President’s Report

1. WestEd Appointment of Carol Lippert Recorded comments are available (Part 1/00:01:58)  
President Miller announced Carol Lippert’s appointment to WestEd.

Item 1B – Superintendent’s Report

1. Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST)

- Marni Landry, Paradise Valley High School
- Shannon Mann, Osborn Middle School

2. 2015 CIO 100 Award

• Mark Masterson Recorded comments are available (Part 1/00:02:21) Superintendent Douglas presented awards as listed on the agenda.

Item 1C – Board Member Report Recorded comments are available (Part 1/00:10:25)

Amy Hamilton gave an update to the Board regarding the Teacher Principle Evaluation Task Force.

Jared Taylor gave an update on the Arizona Standard Development Committee.

Executive Director Christine Thompson gave an update and spoke to Board members regarding the Standard Development Committee.

Item 1D – Executive Director’s Report

Recorded comments are available. (Part 1/00:16:08)

No report.

A. Consideration to approve the following contract abstracts for distribution of grant funds pursuant to A.R.S. Title 15, Article I:

1. 21st Century Community Learning Center Grant
2. Migrant Education Program – State Migrant Parent Advisory Council (SMPAC)
3. Migrant Education Program – Binational
4. Migrant Education Program – Migrant Hotline
5. McKinney-Vento Homeless Education Assistance

B. Consideration to approve additional monies for teacher compensation for Fiscal Year 2015-2016 to districts that have submitted Statements of Assurance, pursuant to A.R.S. § 15-952 and A.R.S. § 15-537

C. Consideration to accept voluntary surrender of the teaching certificates held by the following:

1. Rachel Reny
2. Kenneth Melton
3. Agnes Gent
4. Eugene Holloway III
5. Larry Shorty

D. Consideration to accept the proposed settlement agreement for the following:

1. Jennifer Keefer
2. Boone Keefer
3. Beth Hernandez

E. Consideration to accept the findings of fact, conclusions of law and recommendation of the Professional Practices Advisory Committee to grant the application for certification for Stephen Renard  
Recorded comments are available. (Part 1/00:17:22)

MOTION

Member Jacks made a motion to approve the Consent Agenda with the exception of Item 2C5 and 2D1-3. Member Taylor seconded the motion.

Motion passed unanimously

Discussion was held regarding item 2C5.

MOTION

Superintendent Douglas made a motion to accept the voluntary surrender of the teaching certificate held by Larry Shorty. Member Carter seconded the motion.

Motion passed unanimously.

Discussion was held regarding items 2D1-3. Members requested a future agenda item concerning the effects of teacher contract breaks on teacher recruitment and retention.

MOTION

Member Carter made a motion to accept the proposed settlement agreements for the following:

- Jennifer Keefer
- Boone Keefer
- Beth Hernandez

Vice President Ballantyne seconded the motion.

Motion passed unanimously.

Item 3. - CALL TO THE PUBLIC

Recorded comments are available. (Part 1/19:22)

The following members of the public spoke during Call to the Public:

- Alan Watt, Phoenix Peace Initiative
- Russell Kukla, CreateK12change.org
- Joe Geusic, Arizona Resident

GENERAL SESSION

4A. Presentation, discussion and consideration of request for a rehearing of decision to deny application for certification for Matthew O. Campagna

Recorded comments are available. (Part 1/55:58)

Mr. Charles Easaw, Chief Investigator, presented this item to the Board. Mr. Campagna addressed the Board via conference call.

MOTION

Vice President Ballantyne made a motion to deny Mr. Campagna's request for reconsideration, pursuant to R7-2-709, Member Jacks seconded the motion.

Roll Call Vote was taken. Members Crow, Schmidt, Carter, Rottweiler, Taylor, Jacks, Hamilton, Superintendent Douglas, Vice President Ballantyne and President Miller voted yes.

Motion passed unanimously.

4B. Presentation, discussion and possible consideration to accept the findings of fact, conclusions of law and recommendations of the Professional Practices Advisory Committee and accept the proposed settlement agreement for the following:

1. Rogelio Hernandez
2. Kristine Sojourner
3. Brooke Huntington-Smith

4. Zoe Dietrich Recorded comments are available. (Part 1/01:17:19)

Mr. Eric Schwarz, Assistant Attorney General, presented these items to the Board.

4B1. Rogelio Hernandez

MOTION

Vice President Ballantyne made a motion to approve the proposed settlement agreement and issue a suspension, with conditions, through the expiration of the teaching certificates held by Rogelio Hernandez. Member Schmidt seconded the motion.

Motion passed unanimously.

4B2. Kristine Sojourner

MOTION

Vice President Ballantyne made a motion to approve the proposed settlement agreement and issue a 90-day suspension, with conditions, of the teaching certificates held by Kristine Sojourner. Dr. Rottweiler seconded the motion.

Motion passed unanimously.

4B3. Brooke Huntington-Smith

MOTION

Vice President Ballantyne made a motion to approve the proposed settlement agreement, revise the expiration date of Principal Certificate to August 10, 2016 and issue a two-year suspension, with conditions, of the teaching certificates held by Brooke Huntington-Smith. Member Taylor seconded the motion.

Motion passed unanimously.

4B4. Zoe Dietrich

MOTION

Vice President Ballantyne made a motion to approve the proposed settlement agreement, revise the expiration date of Principal Certificate to August 10, 2016 and issue a two-year suspension, with conditions, through the expiration of the teaching certificates held by Brooke Huntington-Smith. Member Carter seconded the motion.

Motion passed unanimously.

4C. Presentation, discussion and possible consideration to approve proposed performance levels (cut scores) for the National Center and State Collaborative Alternate Assessment (NCSC).  
Recorded comments are available. (Part 1/01:45:30 and Part 2/00:03:45)

This item was presented by Dr. Leila Williams, Associate Superintendent for High Quality Assessments and Adult Education, Audra Ahumada, Director of Alternate Assessment and Dr. Lietta Scott, Director of Psychometrics.

Discussion was held and item was tabled until additional data is gathered and provided by the Department. Discussion resumed at 11:45am.

MOTION

Vice President Ballantyne made a motion to adopt the proposed NCSC Alternate Assessment performance levels as presented. Member Jacks seconded the motion.

Motion passed unanimously.

4D. Presentation, discussion and consideration to determine noncompliance with laws applicable to English language learners, pursuant to A.R.S. § 15-756.08 (J) for Bradley Academy of Excellence  
Recorded comments are available. (Part 1 /01:57:35)

Jordan Ellel, Assistant Attorney General, presented this item to the Board.

MOTION

Vice President Ballantyne made a motion to find, for the reasons stated in ADE's letter of noncompliance dated April 23, 2015, that the Bradley Academy of Excellence is noncompliant with the

laws pertaining to ELLs, thereby barring the District from receiving any monies from the Arizona Structured English Immersion Fund established by A.R.S § 15-756.04 for ELLs and from reducing the monies spent on its ELL programs despite the loss of monies caused by its noncompliance. Dr. Rottweiler seconded the motion.

Motion passed unanimously.

As required by law, ADE shall monitor the Bradley Academy of Excellence to ensure that the District does not reduce the amount of monies spent on its ELL programs. The Bradley Academy of Excellence shall be entitled to receive monies from the Arizona Structured English Immersion Fund only upon confirmation to the Board by ADE that the LEA has come into compliance with the laws pertaining to ELLs.

4E. Presentation, discussion and consideration to approve qualification scores for the Move On When Ready (MOWR)/Excellence for all Cambridge International Examinations IGCSE English Literature and Mathematics (Extended), articulate the qualification scores for the Cambridge systems using the Cambridge letter grading system, and approve the refinements to the structure of the qualifications system within Cambridge for the Grand Canyon Diploma  
This item was removed from the agenda prior to the meeting.

4F. Presentation, discussion and consideration of the recommendation of the chief procurement officer regarding the Request for Proposals (RFP) for the technology provider for the K-6 technology based language development and literacy intervention pilot program pursuant to A.R.S. § 15-217. Pursuant to A.R.S. § 38-431.03(A)(2) and (3), the Board may vote to convene in executive session to review confidential information and/or for discussion or consultation for legal advice. Recorded comments are available. (Part 1/02:12:00 and Part 2/02:17)

Patty Clark, Chief Procurement Officer for the Department of Education, and State Board of Education Executive Director Christine Thompson presented this item to the Board.

#### MOTION

Superintendent Douglas made a motion to convene into Executive Session to review confidential information and/or for discussion or consultation for legal advice. Member Taylor seconded the motion. Motion passed unanimously.

Meeting convened into Executive Session at 11:20pm. The Board reconvened back into Regular Session at 11:40pm.

Dr. Rottweiler made a motion to agree with the recommendation of the chief procurement officer that the award of the contract for the technology provider for the pilot program prescribed in A.R.S. 15-217 to the Scientific Learning Corporation is in the best interest in the State. Vice President Ballantyne seconded the motion.

Motion passed unanimously.

4G. Presentation, discussion and consideration to initiate rule making procedures for proposed amendments to rule R7-2-615(L) regarding Structured English Immersion (SEI) Endorsements  
Recorded comments are available. (Part 2/)

Executive Director, Christine Thompson presented this item to the Board.

#### MOTION

Vice President Ballantyne made a motion to initiate rulemaking procedures for proposed amendments to rule R7-2-615 regarding Structured English Immersion Endorsements. Member Carter seconded the motion.

Motion passed unanimously.

4H. Presentation, discussion and possible action to adopt the proposed AzMERIT 3rd grade Reading score which demonstrates a student's reading falls far below the third grade level for purposes of promotion, as required in ARS §15-701 (Move On When Reading cut score)  
Recorded comments are available. (Part 2/16:10)

The following members of the public spoke during Call to the Public:

- Ilde Lesko-Kerr, Vice President of Academics, Arizona Charters Association
- Joe Thomas, Vice President, Arizona Education Association

- Jennifer Kasten, Parent and Leader of Public Policy, Decoding Dyslexia Arizona

#### MOTION

Dr. Rottweiler made a motion, seconded by Member Carter, to adopt the proposed AzMERIT 3rd grade Reading score to demonstrate a student's reading falls far below the third grade level for purposes of promotion, as required in ARS §15-701, for the 2015 and 2016 administrations of AzMERIT; to only report the 2015 scores to districts; to require the Department reconvene a standard setting committee to provide a recommended "falls far below" level for subsequent years; for the Department to present recommendations at a subsequent meeting; and for Board to seek additional legislation regarding Move On When Reading as necessary to align with the current statewide assessment.

Motion passed unanimously.

Member Crow left the meeting at 1:10pm

4I. Presentation, discussion and possible consideration regarding Douglas v. State Board of Education (CV2015-006171). Pursuant to A.R.S. § 38-431.03(A)(3) and (4), the Board may vote to convene in executive session, which will not be open to the public, for discussion or consultation for legal advice with the Board's attorneys and/or for discussion or consultation with the Board's attorneys in order to consider its position and instruct its attorneys in pending or contemplated litigation or in settlement discussions conducted in order to avoid or resolve litigation.

4J. Presentation, discussion and possible action regarding the execution of the May 18, 2015 Board policy requiring the Superintendent to grant the employees of the State Board Investigation Unit access to necessary documents, records and electronic information. Pursuant to A.R.S. 38-431.03(A)(3) and (4), the Board may vote to convene in executive session for discussion or consultation for legal advice with the Board's attorneys.

Recorded comments are available. (Part 2/01:32:00 and Part 3/02:25)

Mary O'Grady gave an update on item 4I.

Executive Director Thompson gave an update on item 4J.

#### MOTION

Member Schmidt made a motion, seconded by Member Hamilton, to convene into Executive Session for discussion or consultation for legal advice with the Board's attorneys and/or for discussion or consultation with the Board's attorneys in order to consider its position and instruct its attorneys in pending or contemplated litigation or in settlement discussions conducted in order to avoid or resolve litigation.

Motion passed 8-1, with Superintendent Douglas voting no.

Superintendent Douglas announced she would recusing herself from the Executive Session.

Meeting reconvened back into regular session at 1:55pm, and Member Rottweiler left the meeting.

#### MOTION

Member Schmidt made the following motion, seconded by Member Jacks: "I move that pursuant to A.R.S. § 15-203(A)(7) and A.R.S. § 15-251(5), the Board continues to direct the Superintendent to provide the Board's Investigative Unit with virtual access to the directories and files necessary to fulfill their duties at their offices in the Executive Tower and that the Superintendent provide this access by the close of business Tuesday, August 25, 2015. And if the Superintendent does not comply with this policy, the Board President shall call a special meeting of the Board as soon as possible."

Roll Call Vote was taken. Members Schmidt, Carter, Taylor, Jacks, Hamilton, Vice President Ballantyne and President Miller voted yes. Superintendent Douglas voted no.

Motion passed by a vote of 7-1.

#### 5. SUMMARY OF CURRENT EVENTS, FUTURE MEETING DATES AND ITEMS FOR FUTURE AGENDAS.

The executive director, presiding officer or a member of the Board may present a brief summary of current events pursuant to A.R.S. § 38-431.02(K), and may discuss future meeting dates and direct staff to place matters on a future agenda. The Board will not discuss or take action on any current event summary. Recorded comments are available. (Part 3/05:45)

Ms. Thompson discussed previous request regrading the RFI for high school equivalency testing.

Member Taylor requested a future item regarding courses used for the 4th math credit requirement.



Item 5. - ADJOURN Meeting adjourned at 1:58pm.

463. The standards should be organized around big ideas of content, practice, and cross-cutting concepts in alignment with NGSS. The Superintendent's edits to the standards have transformed the document from standards to lists of disconnected "facts" and factoids that are scientifically incorrect.
464. Recent changes made by the ADE make the standards confusing
465. They seem to be absurdly complex. Could probably be streamlined a lot. My impression is that they go into unnecessary detail.
466. The inclusion of Key Concepts was probably an attempt to clarify some ideas, but in reality it added an unnecessary layer of confusion.
467. OK
468. The Standards are clear and easy to read. Thank you for the effort spent!
469. Detailed, generally well-organized. I only hope that teachers will be able to translate the content into meaningful teaching activities.
470. Well done.
471. I do consider the structure of core ideas, practices, and crosscutting concepts as effective, but they become diluted with the use of the "Big Ideas" document, and are further complicated by what seems like a somewhat random and topical assortment of examples/"Key concepts" that are given in the right hand column of the standards document.
472. 1. There is lack of clarity between the use of high school and high school plus.  
2. The "Key concepts" column creates confusion by insinuating exactly what should be taught. It is more akin to curriculum, not a guiding standard.  
3. I don't know why these are connected to AZ health standards.
473. However, they have been changed so that they intentionally strive to MISLEAD and do not represent TRUE science.
474. Seems good.
475. I object to the idea that intelligent design is interchangeable with evolution.
476. Original language should remain
477. They should not be changed.
478. Science Standards should be as the scientific community understands them. ReWriting science standards to include theories that are not theories and magnetic currents are just wrong. Let people who are in the science field decide what is appropriate and what is theory - and lets not teach quackery.
479. This depends on who they are written for. I found a great deal of repetition, and unnecessary verbiage.
480. The removal of the term "evolution" from the DRAFT submitted by the qualified educators makes the DRAFT Science Standards less easy to read.
481. These standards seem thorough with the exceptions of the life-science sections.
482. Intelligent Design / creationism are untested/ unprovable Ideas. Totally religious in nature  
No scientific rigor to back them up.  
Doesn't mean they can't be discussed but science is a provable topic
483. Teach evolution. Evolution is science.
484. The standards list is incomplete and moot without evolution.
485. Too much educational jargon.
486. Reasonably easy to follow and read. However, I refer you to the letter sent to you by the Association for Science Education (u.k): [https://ncse.com/files/ASE\\_letter\\_to\\_Arizona.pdf](https://ncse.com/files/ASE_letter_to_Arizona.pdf)
487. It is wrong to miseducate our children & remove scientifically proven information, in particular "evolution", from the standards.
488. The inclusion of creationism, and the weaking of the teaching of evolution. Creationism it's not a science but a religion belief. This is a science class, and science is what should taught.



489. Well organized
490. I think the move to teach the periodic table in 6th is a good move
491. Generally well organized but the changes regarding dogmatic "evolutionism" are a welcome change - LONG OVERDUE
- Diving instruction on different forces into different grades is less efficient and prevents the ability to look at the foundational role of forces. one significant problem comes from students understanding the difference between mass and weight.
- The further dividing of energy into different grades threatens mastery. A deep understanding of the idea that work is the transfer of. Energy and energy is the ability to do work assumes a foundational understanding of forces. Presenting kinetic energy ( $1/2mv^2$ ) in 6th grade will present a significant
492. math barrier to comparing stored energy to the energy of motion.
- The standards also lack a focus on the fact that all matter has properties. It is these properties that differentiate types of matter and link matter to how we use them to solve problems.
- Chemical bond types should remain in high school because the difference between covalent and ionic bonds is both subtle and profound and requires a sophisticated understanding of subatomic particles and the organization of the Periodic Table.
493. They are organized by grade and topic, then detail the learning objective. Great.
494. Some of the changed wording makes less sense than the previous version and is confusing to understand. This appears to be, in some cases, a way to remove teaching some concepts.
495. This is not the issue.
496. The spiraling of concepts across grade levels helps students deepen understandings over time.
497. The organization is excellent.
498. I have no objection to the general layout of topics.
499. The standards do not reflect the work of the educators who worked for over a year to develop
500. Only SCIENCE in Science class!
501. Adequate
502. Intelligent design is not science keep religion out of public schools
503. The organization of the science standards gave a clear presentation of the standards being put forth. They were well done and easy to follow.
504. Properly tailored to the level of instruction at each grade level.
505. Listing the individual concepts to be mastered by "code" in the cross reference chart is VERY confusing!!!!
- Those writing these standards should be experts in science and/or education.
- At a minimum they should understand what the word "THEORY" means in scientific terms.
- 506.
- Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
- I didn't intend to comment on the organization of the Science Standards since I haven't examined
507. them in detail. I marked "Disagree" due to the Intelligent Design" verbiage; since Intelligent Design doesn't follow the scientific process it is confusing, and would affect the organization of the content.
508. Too much information presented in too little detail
- As a member of the Standards Committee, I am greatly concerned with what was done in a closed
509. process without the original Committee having the opportunity to comment on the MAJOR changes and deletions made.
510. Keep religion out of public schools, not every family believes the same.
511. The science standards are deliberately organized to require science teachers to include religious

superstition in the form of "intelligent design"; they also eliminate or greatly restrict the mention of evolution and downgrade it to just a theory among competing theories.

512. They are organized in such a way that it's hard to understand them.
513. Standards are based upon false hypotheses, as such this connotes agreement upon other subjects.  
The draft is nonrigorous to the point of absurdity. Your religious lobbyists are trying to manufacture doubt where no doubt credibly exists. Instead of encouraging students to doubt evolution, why don't you ask yourselves if you have ever doubted the existence of God or an all-powerful intelligent creator. Who's close-minded now?
514. Written by professional science educators.
515. The Science Standards are organized well.
516. The science standards are sufficient as they are. They should never be amended such that the fact that evolution is a scientific fact and a bedrock for modern viology to stop being taught to children.
517. They're missing key scientific language crucial to a fundamental understanding of biology and, by extension, the entirety of the biological sciences.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
518. Organization is adequate.  
The science standards before editing were clear and concise, and showed an understanding of what makes an actionable education goal. During the editing process an extra column was added to each table of standards which consists of lists of terms. For example, under space and science standards the following was added: "Weather, seasons, weather patterns, sun, temperature, thermometer, clouds, types of precipitation" These lists are not actionable goals but simply a hodgepodge of somewhat related terms.
519. Further, sever guidelines were changed from being specific and actionable to being vague to the point of being unhelpful to teacher. For example:  
"Investigate the properties of earth materials, design and evaluate suitable habitats for organisms using earth materials." was changed to "Obtain, evaluate, and communicate information about the properties of earth materials." The former has clear goals that suggests lesson plans: students will explore the composition of different terrestrial environment and evaluate whether and how they can support life. The latter is vague and suggests no specific lesson other than "students do something related to earth materials".
520. Too much "eduspeak" & I needed more caffeine to get me through the whole document
521. The science standards create ways of avoiding teaching evolution.
522. I believe all children should learn the effects fossil fuels have on the environment.
523. They are very well organized.  
Having everything relate back to the original 14 core concepts is a good overall organizational concept, but after that the language and organization seems more vague and less concrete than in the 2004/05 standards  
Please note that this is a continuation of my review. The system gave a warning that I had only a few minutes left and advised me to save. I have not seen a save button, so am continuing this where I left off with specific grade level comments.
524. This was already included.  
As a member of the Standards Committee, I am greatly concerned with what was done in a closed process without the original Committee having the opportunity to comment on the MAJOR changes and deletions made.  
Evolution is the standard accepted by scientists. These are scientific textbooks, maybe they should
525. represent the best knowledge we have today and not the dumbed down version the creationists want to force upon us.
526. evolution defined and taught incorrectly

530. It appears to be organized.  
Light green font color shows poorly--should use a dark color like navy blue for edits.
531. Key concepts listing of science standards often references science standards--confusing, possibly circular--to what is a reader expected to refer?
532. The organization is fine, though I don't love that Physics and Chemistry are mixed together when the other disciplines have their own sections.
533. In general, these are easy to read and I like the overall organization and layout.  
The science standards appear to remove the teaching of evolution, which is not scientific. Remember, also, that the teaching of intelligent design has been ruled unconstitutional because it advances the role of religion in public schools.
534. These standards are an unconstitutional ploy to put a creationism agenda into the curriculum and confuse students about the scientific fact of evolution  
The sections are conveniently broken up by grade level. These are further organized based on
535. physical, earth and space, and life science standards. The way(s) in which these areas of study are connected to other academic disciplines is straightforward and has been well implemented.
536. It's hard to read a draft that aims to do so much damage to a child's education.  
It is difficult to argue that the "standards" are well-organized and easy to read when they are in fact
537. so poorly designed. It does little good to clearly explain something that is so nonsensical in every other respect.
538. Organization was clear and logical.
539. While I disagree with them, they are clear.
540. Simple, and easy to follow.
541. Very wrong not to teach proven Science...
542. Follow same format- easy to determine the standard.  
They WERE well-organized until they were edited by non-scientists/non-educators. We will do a GREAT disservice to students in Arizona if non-scientific views, i.e., religious views, obstruct the established scientific truth in the standards. Already military families avoid our public schools because the Arizona Legislature does not invest in our children. Now they will avoid the public schools because of the antiquarian myths perpetuated in the standards. It is essential that real science be taught in Arizona.
543. Evolution is not a theory. It is proven. It is ongoing in our lifetime that living creatures and plants adapt and evolve. Stop injecting uncertainty in to scientific methods.
544. confusing
545. Please teach evolution and not creationism
546. Well organized.
547. key components within each grade level cluster allow appropriate categorization of content topics/strands.  
While the grammatical changes do improve the standards, evolution should be included as a fact, not a theory. If students want to explore theories, philosophy classes in college and bible studies can assist students' with ideology that has not yet been proven.  
I think the organization reflects the foundational documents, the Framework for K-12 Science Education & the Big Ideas in Science.  
Not sure where to put this comment so I'll put it here. The wording of the Big Ideas (knowing and understanding science) came from published sources- the wording for several of these big ideas has
548. been altered throughout the document. The original document should be referenced and the original language of each of the big ideas should be retained. Specifically: P4 the words "in a closed system" were added. L4 The wording should be returned to the original "The diversity of organism, living and extinct, is the result of evolution". U1 The wording should return to: Science is about finding the cause or causes of phenomena in the natural world U4 The wording should return to: Applications of science often have ethical, social, economic and political implications.
549. Teach Science
550. The standards are no longer grouped in a logical order. 7th Grade is no longer Earth and Space, which

are two sciences that traditionally go together. Instead physics has been added and geologic time has been added to 8th Grade. There is no longer a logical flow and connection within each grade level. It seems very random.

554. as I read them on line, they seemed well organized
555. Given that it's an official document, not (for instance) a work of lyric poetry, it's reasonably approachable.
556. The organization of the Science Standards is not the reason for my current comments.
557. I would prefer a "neither agree nor disagree" option.
558. K-12 Framework for Standards for Science and cross disciplines clear and concise
559. well organized
560. N/A
561. The current (2004) standards are fine. The proposed changes regarding the removal of "evolution" and "Big Bang Theory" are an affront to intelligent, educated people and these changes have no place in the Arizona State Science Standards!!  
I felt that they were well organized into overall concepts and broken into units well. As a 4th grade teacher, I felt that the content was better distributed among the grade levels making not so heavy in 4th grade. I agree with some of the content like plants, classifications of plants and animals, and cells were given to other grade levels so that 4th grade could use its energy to concentrate mostly on earth science which is an extensive part of the curriculum.
562. 4th grade. I agree with some of the content like plants, classifications of plants and animals, and cells were given to other grade levels so that 4th grade could use its energy to concentrate mostly on earth science which is an extensive part of the curriculum.
563. The key concepts don't make sense. They are VOCABULARY words, not concepts
564. By not using the word evolution some parts of it make little or no sense.
565. I prefer the old format
566. well organized and easy to read and follow
567. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
568. This formatting is not the easiest to read. The tables just seem to make it more confusing. Instead of having to read it right to left, top to bottom like the old standards would be easier to read. Also, the colors make it more difficult to follow what is happening, even though their intent is probably the opposite.
569. Mrs. Douglas needs to get with the 21st century and science.
570. This is long over due, and a step in the right direction.
571. The deliberate intention to obfuscate the critical role evolution has in biology by definition makes this "not easy to read" in the sense that it makes it hard to ferret out the insidious influence of groups with special interests.
572. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn. Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
573. I don't have a problem with the organization of the standards. My disagreement is with the substantive changes of the standards.
574. Biology is a science, not a background text to insert the Education Secretary's personal religious beliefs. There is no place for "creationism" or "intelligent design" in public school textbooks. The addition of ANY language purporting to introduce these religious concepts, which are NOT related to actual biological processes of evolution and selective adaptation, is scientifically ridiculous and foolhardy. It also violates the basic separation of church and state as specified in the United States Constitution First Amendment. As an attorney, I must say you that introducing these religious concepts into public school textbooks could well be legally actionable. Existing, science-based biology textbooks need no revisions or additions. Please abandon this misguided attempt at placating a few religious conservative voters, and consider the overwhelming majority of Arizona citizens that want no religious intrusion into public education.

575. Please do NOT make changes that remove or downplay references to evolution and the big bang made by Diane Douglas. These changes, made to support a religious agenda by a person who is on the record as supporting "intelligent design" (which is about as scientific as believing that Mickey Mouse controls the weather) would do our students a great disservice by removing or mumbling through references to genuine scientific principles and theories. Because they are supported by rigorous scientific research, data and real-world observation, evolution and the big bang are scientific theories. The "intelligent design" driven Ms. Douglas supports is based on religious beliefs and has no place in public education.
576. Confused wording throughout downgrades the understandability of the document
577. This proposed change is ridiculous and takes students back in time and will ill-prepare them for the future.
578. don't confuse science with religion. teach science in school. teach religion in church or temple.
579. Should be written by scientists ONLY
580. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
581. Teach science, not religion. Diane Douglas is a religious fanatic, which is her right. However, she has no right to impose her religious views on the children of Arizona. Public schools are not allowed to teach religion. Evolution is not a "theory". It is based on sound science. That science should be taught to our children in science classes. If Ms. Douglas wants to teach "creationism" and "intelligent design", then she should get a job as a Sunday School teachers and subject the children in that environment to her unscientific beliefs.
582. It seems like a good, logical structure.
583. De-emphasizing evolution and the Big Bang true a science instruction in those areas on its head. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
584. Evolution is an integral part of it without religion of any form included.
585. reasonably clear
586. Competent
587. Organization is fine, the problem is their intention to alter already correct science standards.
588. My wife and I find the proposal fundamentally wrong and therefore, are sickened when reading the proposed revisions to the Science Standards.
589. The organization of the standards are sufficient. Breaking them down across the three major sciences for 6th grade is a good decision. Though, pretending to integrate the scientific method into the standards will not benefit students. There is no foundation laid for 6th graders here.
590. The standards are extremely confusing. Originally, they seem straight forward, but then after looking into them more in depth, the cross curricular content makes it even more confusing. I do enjoy the new key concepts which will help the teachers to understand a little more, but in some circumstances they are still so vague. In 8th grade we are supposed to teach about how energy can transfer and how energy affects wave characteristics, but that can mean so many different things. We need a more specific guide on what you want us to teach.
591. You have to flip through the standards too much to see exactly what was taught previously and what you need to teach at your grade level. There is not enough specificity as to what is expected at each grade level.
592. I like how in the draft the broad core ideas for knowing science are tied together in one chart. I do not like how the 6th grade standards have taken on the former 8th grade standards. I don't think the students are going to be ready for those concepts developmentally at this level. I don't think the flow of standards are as good as they use to be.
593. The labeling of the standards is very confusing, and the titling of each is difficult to remember. i.e. 8.E1U1.6.
594. While looking at the standards, they appear neat and easy to read, but when you pull apart all the core ideas, there is more information in the coding. This then makes the standards quite overwhelming and difficult to follow. Having to go from one sheet to another in order to understand what I need to teach and how I need to document that is difficult. It is lacking precision.
595. Overall, I like the new standards. I am very concerned that the teaching of evolution is being diluted,

and what that implies.

Some topics are being moved to lower grades, for example the periodic table is being moved from 8th to 5th. I'm concerned it will be difficult to teach all the concepts to kids who are so young. More importantly, science is largely ignored in K-5, because such an emphasis is placed on ELA/Math. Even fourth grade teachers currently complain about lack of time to teach science.

596. I like how they are "chunked" and how the language is easy to understand. However, I feel that the standards are quite broad - there is a lot of room for interpretation, which could be good and bad depending on the instructor's confidence level and access to resources.

597. The standards for 7th grade don't flow together at all. It looks like someone just picked some random standards and put them at the 7th grade level. If someone wants the students to come away each grade with more content knowledge then we need to start at a basic level and allow the teachers to continuously build on the students prior knowledge; instead of waiting a few years to circle back to standards. Right now there are concepts at the lower levels that those students can't grasp because they just don't have the background.

598. I have no problems with the understanding the expectation of what is to be taught to reach each of these standards.

599. There are a lot of components to each standard such as core ideas, crosscutting concepts, engineering practices, and lower grade level connects which all require you to look in different places within the standards.

600. I am very concerned about the proposed changes related to evolution. Any deletion of the term reflects an anti-science bias most likely with religious motives.

601. they are structured ok.

Have not looked.... I am here to comment on the proposed wording for evolution and the Big Bang. I do not understand the need to spend time and resources developing standards specifically for AZ when there are national standards that have been developed by experts: NGSS. I strongly support the NGSS because "K-12 Science Education Should Reflect the Interconnected Nature of Science as it is Practiced and Experienced in the Real World.

'The framework is designed to help realize a vision for education in the sciences and engineering in which students, over multiple years of school, actively engage in scientific and engineering practices and apply crosscutting concepts to deepen their understanding of the core ideas in these fields.' The vision represented in the Framework is new in that students must be engaged at the nexus of the three dimensions:

1. Science and Engineering Practices,
2. Crosscutting Concepts, and
3. Disciplinary Core Ideas.

602. Currently, most state and district standards express these dimensions as separate entities, leading to their separation in both instruction and assessment. Given the importance of science and engineering in the 21st century, students require a sense of contextual understanding with regard to scientific knowledge, how it is acquired and applied, and how science is connected through a series of concepts that help further our understanding of the world around us. Student performance expectations have to include a student's ability to apply a practice to content knowledge. Performance expectations thereby focus on understanding and application as opposed to memorization of facts devoid of context. The Framework goes on to emphasize that:

'...learning about science and engineering involves integration of the knowledge of scientific explanations (i.e., content knowledge) and the practices needed to engage in scientific inquiry and engineering design. Thus the framework seeks to illustrate how knowledge and practice must be intertwined in designing learning experiences in K-12 science education."

The proposed AZ standards are outdated and will not prepare our students for the 21st Century.

603. Easy to read

604. Standards are well organized

605. NC

606. As a lay person, I find it a bit hard to follow. I would defer to the opinions of science teachers and professionals on this, however.

607. Religious viewpoints should be taught in church and by parents, not by science teachers and the Dept. of Ed. should have no role to play in introducing religion into school science curriculum. Encourage teachers to help students explore science and use their native curiosity and not stifle by making teachers offer biased information.

608. I have not read the official document. My opinions are based on public information as provided by TV



- and newspaper.
609. The organization and readability of the new draft standards are not in question. The scientific content and accuracy are a matter of concern.
610. While I have not read all of the Science Standards, I found what I have read to be in many cases wordy: run-on or exceedingly long sentences, and repetitive phrases between sentences. Also, some language choices seem cryptic, and could be written more clearly.
611. As a parent of 2 daughters who attended K-12 as well as undergrad and graduate schools in Arizona, I oppose the changes to the science curriculum that Diane Douglas is proposing. Science belongs in schools and the bible belongs in the religious community. Science and technology are moving at lightning speed today and to muddy the waters of content is depriving Arizona students of the tools they need to compete in the world. The Arizona education system is ranked well behind the rest of the country and the United States has fallen behind many industrial countries.
612. pretty easy to read, a little repetitive
- I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
613. How can you consider these well organized when you obfuscate and de-emphasize the critical role science plays in a child's education through their scholastic experiences from kindergarten through college? You are attempting to muddy the waters and mix specific religious views with accepted, peer-reviewed science. That is deceitful and misrepresents the best available science.
614. Standards should be totally evidence based and not on any specific religious beliefs or dogmas
615. I will not comment on the organization of the standards because I am not a teacher.
616. The design of the standards are easy to follow and should help teachers identify the focus of required instruction.
617. Any attempt at questioning the role of evolution in our existence or any question as to the theory of how we became what we became as put forth by 98% of all scientist is an injustice to every Arizona student and please, please must not be done.
618. They are better but still not great.
619. Leave the organization remain as it is.
620. no comment
621. A bit dense for the average parent/public. I realize the necessity of being thorough for the professional reader, but a annotated version more user friendly would be helpful.
622. Under Core Ideas of Using Science and Core Ideas of Using Science, the author appears to add word salad to remove the word, Evolutioin, from the document. Many similar examples throughout.
623. Of course you should teach evolution, why ever question that?
624. KEEP the word EVOLUTION in the standards. Evolution is accepted science . There are NO alternative theories that are no religiously based.
625. Evolution is no longer a theory it is proven fact and must be taught in our science classes.
626. Overall, I support the move towards larger concepts that are better connected to each other. The standards reflect necessary changes to the science education in AZ and should be put into action right away.
627. This feedback form attempts to hide the actual crux of this debate (Evolution vs. Creationism). These questions about the entire content of this draft are insignificant. Douglas should have been less Draconian and put out a survey that only states the actual changes proposed to the Physical Science part of the Curriculum. Everything else is just a diversion to confuse.
628. NOTE: ALL COMMENTS ARE PERSONAL OPINIONS AND DO NOT REPRESENT THE OPINIONS OF MY EMPLOYER
629. There is no place for religious beliefs in the school system
630. They are NOT easy to read since Sister Mary Diane Douglas is trying to fool the public into believing she truly wants to educate the children of AZ.
631. Organization of the science standards is not the issue. At issue is whether religious beliefs will be allowed to guide science instruction.
632. No issues.

633. The content infringes on separation of church and state.
634. Well done by educators who understand the needs of students with out editing by politicians who have no understanding of scientific principles.
635. Add a table of contents to help readers find things they are looking for!
636. Ambiguous and misleading comments about evolution
637. You need a table of contents
638. Keep it simple.
639. Well-written and well-organized.
640. These appear to parallel the organization in NGSS.
641. Learning progressions are critical to providing appropriate grade level rigor, and can lead to differentiation for students. What causes some confusion is the designated focus on only certain crosscutting concepts is too limiting - schools & districts should determine which and how crosscutting concepts will be developed throughout all grade levels in their curriculum development.
642. I have no qualms with the organization of the standards at this time.
643. I have concerns about the Key Concept section. I am not sure what is meant by 'Refer to standard' in some areas.
644. The theory of evolution should not be omitted from the Science Standards, removing the comment unity and diversity of organisms, living and extinct, is the result of evolution is egregious and only benefits in further weakening of our education system.
645. It is organized but incredibly simplified. I'm looking at the 4th grade standards and there is really no depth of content.
646. Keep your religious beliefs out of the public schools. There is a separation of church and state in the US. If you wish to teach unitellable, do it at church!
647. I am not concerned about the organization of the document
648. Really appreciate making the draft with internal review comments readily available, this facilitates a more thorough review.
649. The color coding is the same as the science and engineering practices, core ideas, and crosscutting concepts, not clear. Plus, you must know the core ideas for knowing science and using science to read the grade band standards.
650. They weren't horrible to read but definitely need to be cleaned up a bit.
651. A...B...C... But, by analogy, the fine organization of garbage does not make it more than garbage.
652. This document is an affront to critical thinking!
653. No Comment
654. Standards are relatively easy to follow. Some charts appear to be designed with space saving in mind and not readability.
655. color coordination works well, the headings and definitions of standards, curriculum, and instructions are clearly stated and delineated
656. For a non-educator and non-scientist this is not an easy read but I am not sure it needs to be.
657. Religion has no place in the classroom that is why we have a separation of church and state.
658. The quantity of coding - particularly referring back to previous topics - make it very difficult to read. Hard to have a coherent full image with so much of the text abstract.
659. I especially like the connections to other areas of the curriculum.
660. None
661. The science standards are concise but not thorough enough. For instance, the chemistry standards should be broken down into subdivisions of chemistry. Students should be able to explore the branches of chemistry such as biochemistry, organic chemistry, and inorganic chemistry. This is essential for students at all levels. The content in the HS chemistry standards are very specific to inorganic chemistry (also known as "General Chemistry" in high school). For students entering college



- for the allied health fields or pre-professional allied health fields, a solid foundation in chemistry will be necessary to prepare students for college level chemistry, a prerequisite for organic chemistry.
- I feel that the "Key concepts include but should not be limited to" part of the standards outline is unnecessary.
662. I am confused as to why "science" and "engineering" are separate. I do not feel it is necessary.
663. Does not need any non scientific hypothesis such as creationism
664. They read very similarly to the College Board standards.
665. I am fine with the organization .
666. Science is not based on religious fantasy. Creationism is fantasy!
- The standards are poorly worded. The behavior expectations of the objectives are too cumbersome.
667. There are too many cognitive actions (e.g. Observe, record, and ask questions; Observe, describe, ask questions, and predict). The conditions are also vague and mostly at a DOK-1 or DOK-2 level.
668. The committee did a good job. Just remove the edits by Douglas and you have a reasonable product.
669. Very cluttered
670. I don't think they need to be altered
671. They are often hard to read and difficult to suss out what exactly each standard is asking for.
672. There are standards that are randomly placed in grade levels that do not make any logical sense for growing and developing curriculum.
673. The attempt to delete the word "evolution" from the document is not acceptable.
- Science standards should reflect the latest information based on peer-reviewed scientific knowledge. For example, evolution should be taught as a known fact. There is no scientific evidence whatsoever for creationism and should NOT be included in the science curriculum whatsoever! As a retired
674. biomedical scientist, I am aghast that this issue is being considered in 2018! Ms. Douglas is not qualified to make such a decision for Arizonans and should not change the Science Standards without extensive review by noted scientists at our higher education institutions of ASU and UA. Religion should be taught outside of public education and has no place in our school system in Arizona!
- Separating the cross cutting concepts and core ideas for using science from the core ideas and practices makes for cumbersome reading. It would be useful to at minimum have cross cutting
675. concepts embedded within each standard. It would be less confusing if Using Science was separated out completely as an appendix. Connections to other disciplines should be listed as an appendix as well. Key concepts column is redundant to Core Ideas for Knowing Science.
676. You are the dept of ed., not religion. Religion is faith based and there are multiple religions in the world. Science, on the other hand, is fact based. Science belongs in school, religion does not!
677. We must not remove the word evolution from our curriculum
678. We care more about the content than we do about the organization. You can't really organize ignorance anyway.
- They have to be continually modified. The science taught in grade school, needs to expanded as the
679. curriculum moves through the classes. We can't just dump our deepest sciences on grade school students.
- Some of the changes in green have created incomplete concepts; the key concepts are confusing would suggest putting the learning progressions from the document Working with Big Ideas in
680. Science - this allows teachers to see the concepts in context with vocabulary that makes more sense to teachers.
681. Beliefs resulting from the study of the Bible have NO PLACE dictating a science curriculum.
682. They appear to be orderly and generally well organized. Should be easy to follow for most teachers.
683. I understand the process, but this reductionism to this level of detail would be stifling to a competent teacher.
684. The standards are not well organized; they are hard to follow and hard to understand.
685. It is ok.
686. well organized, but I object to any change in language that attempts to undermine evolution as

scientific fact.

687. very vague

Creationism does not belong in public school science curriculum. The purpose of public schools is to educate our children, and the purpose of science curriculum in public schools is to educate children about science. It is not to educate about religious beliefs. Creationism is a religious belief, not a scientific principle. Education about the Big Bang theory and evolution belong in public school science curriculum. DRAFT is a sneaky and underhanded way to impose the religious beliefs of a few on the majority, and it is morally wrong.

689. Organization is sufficient.

These standards - BY DEFINITION - apply to the teaching of science. Such content should be the results of knowledge gained through the use of The Scientific Method, which is a reasoned judgement based on evidence that can be replicated in a laboratory setting. Statements that arise from the acceptance of ANY religious, spiritual or emotional theory as explanation for how history and human activity have changed over time are worthy of study, but DO NOT BELONG IN ANY SCIENTIFIC CURRICULUM. We (still) live in a secular democracy, not a theocracy.

690. I read the Science Standards and redlined version as of Sunday night, attempting to comment while the public survey was down. This version is NOT the version I saw Sunday night. You have removed several areas of redlining as they existed at that time, showing only your replaced verbage; and you have revised the organization of our facing page on the public comment forum to encourage people to look first at the non-redlined version of the Draft. This is misleading and unethical, given the Education Department's clear awareness of the raging debate over changes to terminology related to evolution and the Big Bang theory. You are not serving the public responsibly nor ethically with these manipulations.

692. NGSS is what we are using. We don't even follow AZ standards.

The revisions made by the Department, to the draft that was submitted by the teacher committee, did not add any clarity to the standards, and only muddied the presentation of evolution by the addition of the tentative and ambiguous "theory of" when presenting evolution. Evolution is no more of a theory than respiration and photosynthesis, and to clarify it as the "theory of evolution" is disingenuous and misleading.

694. The science standards are clear, easy to understand, and up to date as they exist current,y.

695. Evolution needs to be taught.

696. The attempt to weave the 3 dimensions as outlined in the Framework for K-12 Education falls short of what is needed. The way the crosscutting concepts are grouped seems forced and often leaves out important connections across grade levels. Please see the NGSS as a model that we could work from, making adjustments as our teachers and content experts see fit.

697. **[No Answer Entered]**

From what I can find online and read the "organization" of the Science Standards seems OK but I object to the attempt to change "evolution" to "the theory of evolution".

698. These are Science Standards. Evolution is science.

Creationism and "Intelligent Design" are stories for Sunday School. These stories don't belong in the AZ Science Standards.

699. Educator speak, no thought given to parents/public

700. The organization is OK but the language of the standards is often scientifically inaccurate. For example, the Core Idea L4 is inaccurate in that the theory of evolution does not merely seek to make clear the unity and diversity of organisms, rather it actually explains the unity and diversity of organisms by way of specific mechanisms that account for the unity and diversity of organisms. The Science and Engineering Practices are referred to as "formerly the scientific method". That comparison/reference is inaccurate. The Practices are not the same thing as the scientific method. They represent a variety of activities that scientists and engineers engage in, whereas the scientific method implied a specific set of steps involved in all scientific activity. In the organization of the standards, there is no indication about how the Cross Cutting Concepts are to be used. If cross cutting concepts are important, then they should be used in organizing the standards in such a way that their place and role in the standards becomes clear. Most of the Key Concepts in the standards appear to be a list of vocabulary terms and may be seen as terms to be learned rather than concepts to be understood. The standards should be organized in

such a way that the concepts appear as integral parts of the standards rather than as separate list of terms.

It is not clear to me why we are relying more on a "foreign" publication (Harlen, 2015) to develop our standards rather than relying more fully on the NRC 2012 Framework, which provides a well organized and well thought out vision for K-12 Science Education.

701. Need to keep evolution.

I cannot endorse any curriculum with religious content. Intelligent design and evolution can co exist,  
702. but intelligent should be taught at home and left to parents to explain their family's belief system to their children.

703. There's a lot to read. Does there have to be so much?

I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution.  
704. I have taken the time to read the proposal for every grade level.

It should be organized based on when the standard should be taught throughout the year building up to more difficult standards.  
705.

These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like  
706. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.

What utter nonsense.

The standards need to be revised with the only agenda being that of advancing science education,  
707. rather than the advancement of a theocratic agenda.

My team and I had to really carefully read to see if we are still teaching anything we are familiar with  
708. in second grade. It appears as though we are teaching most of what we did before we some additions.

709. The standards are fairly easy to read and understand.

710. Some of the wording is unclear and needs to be a voice of a teacher

711. No comment

712. No comment

713. The use of color and strikethrough font made changes very easy to review

This DRAFT should have been designed and vetted by scientists not by Diane Douglas who has no  
714. science training.

Well organized and easy to read??? This is what is important in a science standard? How about the  
715. full knowledge and scope of that particular field! Do not water down the language that defines our science standards!

716. seem fine

Diana Douglas does not have the education background just because she was voted in solely on the  
717. Republican ticket. Teach science not religion.

718. Appear similar to the NGSS

I feel that the 2004 standard format is easy to following and understand. It is easy to see the  
719. standards that go along with each section across all grade levels. The revision is more cumbersome and distracting.

720. Fine

721. Put it back the way it was.

The current draft of the science standards does not reflect the necessary and sought-after shifts in  
722. science education as charged to the Science Standards Committee with respect to organizing the standards around 14 core ideas and developing learning progressions to coherently and logically build scientific literacy from kindergarten through high school.

This new language is vague and sounds made up. As a mother of son in the Math Science Academy at  
723. SHS, I find this disheartening our educators find this is to be at a high standard.

724. Organization seems OK

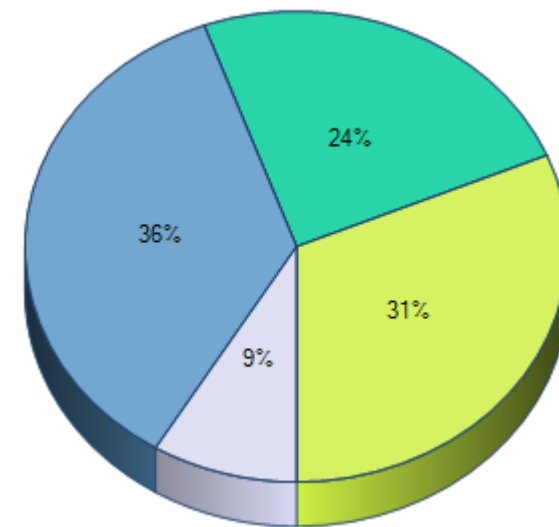
I like the overall organization, however, I feel like the final draft should contain headers and  
725. bookmarks for easy digital navigation. These features aren't hard to add in Word, and maintain their

- functionality once the document is converted to PDF.
726. As a resident living in AZ and a grandparent and a great grandparent of children attending school in AZ, I strongly object to forcing religious beliefs into the educational system funded by taxpayers. This idea cannot be considered good leadership for public education, but simply a way for the Christian church to "get them young"
727. It is surprising how much information is within the standards. This is something that is usually within each district curriculum map instead of standards lists.  
Life Science standards should be ordered in a way that the standards would be taught. Starting small going to large as following the textbook used by the districts. The standards should be dumbed down especially because new teachers could be intimidated.  
Standards need to be broken down and labeled better. Organisms is what we are learning about because biology is literally "the study of life", organisms are alive. The "Cells and Organisms" label should be broken down between organization of life, biochem, cells then maybe broader into specific organization of organisms.  
  
Organization of Life-->Biochemistry-->Cells-->Genetics-->Organisms-->Evolution-->Ecology
729. special education students in high school can have trouble with meeting some of the standards.  
  
The organization is well-planned and communicated. However, the order of the content may need changing.  
  
Organization of Living Things --> Biochemistry --> Cells --> --> Genetics --> Organisms --> Evolution --> Ecosystems
730. I understand that this is a curriculum discussion but it may make life simpler to have that standards in the same order.  
  
At the end of the day, they are definitely well organized and easy to read.  
It jumps around too much from small to big to small. I would like to see the order of the standards going from small to large concepts. Kinda in the way our textbooks sort of do it, following the textbooks that our districts adapted would be beneficial. I hardly use the textbook because we jump around in concepts so much. So the action would be nice to change the order of the standards. As far as reading them, the standards seem a little wordy.....it would be nice to see a little more to the point of what is being asked. Many teachers take each standard differently because it is too broad at times.
731. I do not think it makes sense to label a variety of items in the document as "positive and negative" when referring to implications. Both of those are more charged and leading. I don't see the positive impact of including those words.
732. They're easy to read and identify the different topics but they don't give enough information and examples to go with each topic.
733. It would be more clear if the Science Standards are more clear about which Crosscutting concepts, and Science and Engineering Practices are being applied to each standard.
734. The standards are not clear and are very broad. It leaves so much room for interpretation which leads to confusion.
735. We are back to vocabulary again instead of the scientific principles that make up our standards.
736. I believe that the Three Dimensions of Science Instruction are explained in the opposite order of what they should be: I would start with the Core Ideas and move outward, instead of the other way.
737. keep science in science classes not religious opinions...keep evolution and reject intelligent design. Church and state are constitutionally separate for this very reason. This woman needs to be fired.
738. The suggestions for modifications of Science Standards are not logically organized  
  
While organized, there is some discontinuity in terms of voice and conceptual frameworks - particularly in regards to energy - is there one kind with various transfer and storage mechanisms, or are there different forms? Can it be "used" or merely transferred around? There are others, I will attempt to place them in useful parts below (those that have not already been communicated).
740. The standards are organized in strands that make sense and are cross referenced with other content area skills.
741. The use of a new way but it can be followed
742. The "Use" of Science is a new way of organizing but it is understandable.
743. The "use" of science is a new way of organizing but it is understandable. I can follow it.
- 744.

745. The organization is a new format, but fairly easy to understand.
746. They are bad, You shouldn't eliminate or water down the ideas of evolution and the big bang. They are scientific theories, which have been proven time over time. Evolution is a FACT.  
I think that the layout of the standards is good and, to a lay person, I imagine that they are easy to read. However, I am a recently certified science teacher (middle/high school) who used to work as a professional scientist (teaching is my second career). I found the edited version difficult to read because the edits changed the meaning of the original intent so much and there are fundamental flaws in understanding that are now part of this document.
747. Too complicated.
748. I'll admit it - I mostly skimmed it, and read through the parts that people were in a tizzy about. But despite skimming, it seemed easy to read!  
All faith based or religion related education needs to be eliminated from all science education.
749. Opposing points of views must NOT be taught in relation to Creation Science or Scientific Creationism. We are no longer in the dark ages...!
750. OK

**Total Respondents 751**

**7.** The Science Standards contain sufficient breadth of content.



	<b>Response Total</b>	<b>Response Percent</b>
Strongly Agree	<b>131</b>	<b>9%</b>
Agree	<b>540</b>	<b>36%</b>
Disagree	<b>365</b>	<b>24%</b>
Strongly Disagree	<b>473</b>	<b>31%</b>
<b>Total Respondents (skipped this question)</b>	<b>1509</b>	<b>7328</b>

**8.** Please comment about the breadth of content of the Science Standards.

1. The Science Standards are confusing because they are vague and lack clear objectives
2. Perfect
3. Human body systems were removed from the sixth grade standards. Standards are not comprehensive enough.
4. It appears as though there is less content than the current standards.
5. In fact... there is very little in breadth... or depth. I found the content chunks were not "scaffolded" correctly.
6. Covers all disciplines. However, may be too much breadth to cover in depth for many of the current grade level teaching schedules (again key concepts are too many)
7. The updated standards cover important topics in science that all all grade levels should learn and know. I like how they build on each other through the grade levels.
8. Rocks and Minerals was taken out of third grade, which I think will make it harder for fourth grade teachers to build upon that the next year. There should be more Earth Science.

9. Seemingly haphazard alignment vertically. Some standards are very specific 3.P2U1.1 and others very broad K.L1U1.5  
The breadth of content seems to be sufficient. However, current curriculum will not be able to cover these standards. Districts will need to purchase new curriculum or teachers will need to supplement. This could cause some of the standards to not be covered.
10. I'd say there is too much in the elementary standards.  
The limited number of standards at each grade level bring in to focus the idea that the standards should be taught in a focused manner and not simply skimmed over to "get through it all". The concern is that in the green revisions edits in Kindergarten and 3rd grade it seems that the physical science standards include some life science components when referring to the parts of the human body rather than staying focused on the core idea of physical science. It seems as though the edits are trying to be prescriptive in nature rather than clarifying which would contradict the ideas in the science and engineering practices.
11. Needs to be way more specific... obviously the creators of this have not actually worked with teachers of various knowledge levels. By leaving the content open ended teachers will interpret it in too many different ways. BE specific.. Ex. Newtons First Law... Gravitational forces.
12. The key concepts change the breadth of content by narrowing focus to vocabulary terms
13. I would like to see more of a push for more science and engineering in our schools
14. They don't include relationships with engineering such as the National Science Standards do  
There are really only 3 subsets to teach. There is almost nothing there. The standards that are in place now, while very basic, at least cover a large span of content. With these standards, students are going to be at a disadvantage in terms of content they are taught. If anything, the breadth should have been expanded, not shortened. How in 2018 can there be no engineering standards embedded in the science standards. It's appalling and I can't even begin to describe the disservice we would be doing to our students if these are approved.
15. It covers a variety while not going over too much. This allows students to get a deeper understanding of the content.
16. Almost too much. Your asking teachers to jump from Energy to Geology, to Space all in one year. It's difficult for students at the age group to make connections between different disciplines of science.
17. Just right amount
18. I would like to see computer science addressed.
19. Through the grades there is plenty, though I think there could be more...  
I am confident there are enough topics to cover over the course of the year; however, I am a little concerned about the strands that appear to have been dropped completely (technology and science as a human endeavor). I imagine there is a good reasoning for that, but I do wonder why they were dropped.
20. This part of page 81 "Students can use historical, geographic, and economic perspectives to understand that all cultures have ways of understanding phenomena in the natural world and have contributed and continue to contribute to the fields of science and engineering" is pure fluff and an attempt to say that science isn't "eurocentric." Social justice needs to get out and stay out of the science classroom as much as intelligent design needs to.
21. Ties well with each grade level
22. Too wide per grade level, no connection between a lot of standards
23. wide variety of topics. How will schools find the money for so much stuff.
24. Much more age appropriate.
25. na
26. I think the standards are age-appropriate and cover a wide array of current scientific topics.
27. I appreciate the fact that non-scientific topics (i.e. creationism) are not included in the new standards, seeing as how that topic is religion-based and NOT scientific based.
28. The standards focus in on one concept but do not address the standards needed in order to even begin that concept. Also, the scientific inquiry standards are not even included.
29. It does not have enough breadth of content within a grade level. How are covalent and ionic bonds



- taught without teaching about the periodic table and chemical & physical properties and changes?  
Some of which was taught 3 years prior in the 5th grade.
33. Not enough information for each grade level and leads to necessity of relying on standard previously taught or not taught by previous grade level teachers. This will lead to the necessity of lots of review.
34. Each standard is too broad.
- By including a "Key Concepts" sidebar, the standards as they are would make it difficult for me to plan and focus my instruction on topics of high interest to my students in which I have strong content knowledge and training. Despite the note that these topics are not minimum/maximum requirements for breadth of content, they make the standards seem more about "teaching to a test" that may or may not include those topics than ensuring my students have a firm grasp of science and engineering practices through longer-form projects that provide depth of content and rigor.
35. The standards not in green are amazing. The breadth becomes weird with the connections to other content areas and the key concepts. Both should be removed.
36. No major issues
- Animal behavior is completely absent, yet is a very large scientific discipline. Why is this not integrated? This absence is concerning as it can be one of the most stimulating and exciting ways to learn about biology.
38. Evolution is a central core of understanding biology. The standard about evolution does not account for the explanatory power of evolution by natural selection. Our future health care providers must understand evolution to protect us from antibiotic-resistant bacteria. Our future public health professionals must understand similarities of mosquitoes that carry Zika virus, West Nile virus and Dengue fever. This is impossible to do without understanding evolution and comparing genomes of these insects.
39. In looking specifically at the high school life science standards the standards really only cover processes of life and not organism classification etc. that is included in college biology classes and programs.
40. Too specific
- In thinking about what concepts we want students to enter the adult world with, do they really need to know about ALL of these standards? Students will not remember everything. While these standards are written much better than what we have now, it is still too much to teach for understanding.
42. Students in a core Biology class do not need to know details about photosynthesis and cellular respiration. They don't need to know point mutations. While I see the value in preparing students for upper level courses, we also need to think long term. If students will be voting on issues like the use of natural resources, immigration, access to water, etc. do they really need to know all of this and at this level?
43. Please remember that 4th grade has the standardized test.
44. There was an adequate breadth of content in the HS science standards. I think the move toward more depth is the correct direction, so even less specific breadth would be welcome.
- There is a lot of breadth addressed, perhaps too much to fit in only three high school science courses. I still find it odd that a high school biology course is lacking in any anatomy and physiology. It seems that having an adult understanding of the human body would be one of the things a person without a career in science would find most beneficial.
45. The standards are too shallow and too spread out. T
- Third grade standards are better incorporated. I am concerned about 4th grade being so content heavy, especially on a testing year. Should there be some Earth science to prime kids for fourth, or another way to take some off their plate?
47. The additional phrasing and examples clarify the set standards.
48. The Science Standards have been reduced in comparison to the older standards and do not necessarily provide a specific framework for teachers to follow.
49. The breadth is not balanced across the middle school level. The standards do not all build to the next grade level.
50. The evolution content needs to include information about common ancestry.
51. The breadth should be all in one grade in middle school
52. They do not adequately prepare students for high school. Also, the way they are written does not allow a new teacher or any to build in all the necessary components into a unit of study. Your
- 53.

standards lack appropriate depth and do not include all the sub components needed to truly ensure students have covered all necessary parts to understand that true nature of the standards. For example, you want 8.P1U2.1 to be taught for covalent bonding ionic bond, chemical formulas and types of reactions without telling teachers what smaller concepts/steps should be included to teach to build to understanding of this concept. SO should, the periodic table be taught, what pieces of information do you want taught to build up to these suggested standards. They are too Vague and worse than what we had before.

54. [No Answer Entered]
55. The breadth of content covering each grade band is helpful.
56. The standards have been gutted. It makes me sad, that there is so little left of the old standards.
57. It gives us a chance to go more in depth over a longer period of time.

Has the assessment for the science standards been addressed? The content and rigor is is completely dependent upon how the students will be assessed. If the students will be assessed on true application of the "standards" and the core ideas in knowing and using science then the draft of the standards is perfect (as long as the "key concepts" column is REMOVED). However if the students will be asked recall/vocab lower level questions then there are concerns for how we will maintain consistency from one classroom to another across schools, districts , states etc.
58. I really like how the U standards are represented throughout the other standards.
59. Student will engage their higher level thinking skills with the new standards. The depth and rigor is more within the new standards.
60. There is less details in the standards than in the previous standards, making the new standards appear to be very surface in content.
61. When testing moves to 5th grade it will be difficult for that grade to teach all that they need to teach and review information that was taught in 3rd grade and not reviewed in 4th grade.
62. Only looking at the work the committee did. All ADE changes that the committee did not approve should be removed.
63. Feel they are very vague
64. A lot of content, perhaps too much. It will be hard to review concepts that were taught two years prior.
65. It's hard to tell with how they are written.
66. The breadth of the content is definitely sufficient. Perhaps too much so. I think that the gaps between grade levels will make it difficult to dig deeper within a subject area.

The content appears to make sense progressively as far as concepts go but both cognitively and developmentally advanced for 6th graders. As elementary teachers we are not qualified to judge the breadth of knowledge for some of the concepts which are being introduced at this level. We are not chemistry or physics teachers, we are elementary teachers, so we would need training from ADE or within our district in the content areas. I would want a strong background knowledge of concepts to avoid teaching misconceptions to my students. Educating teachers on content will be necessary to meet these new standards.
67. It contains enough content but does not overwhelm me as the teacher.
68. 3rd seems lighter than is currently is.
69. Of course you should be able to sufficiently cover a wide range of topics so long as they flow into one another and the "breadth" of coverage isn't so vast that you lose any sort of depth.
70. Breadth of content is non-specific, allowing for freedom of teacher delivery methods.
71. The Physical Science Essential Standards are currently shown in column 1 (Discipline Area) as either Chemistry or Physics. I propose that the discipline area column in the Physical Sciences should NOT designate the specific class that these standards are taught in. The reason is because there are standards that are currently listed to be in Physics that are completely necessary in Chemistry too. My proposal is to either take out Column 1 completely or add some Essential Standards for Chemistry. Example 1: HS.P4U1.9 Engage in argument from evidence that the net change of energy in a system is always equal to the total energy exchanged between the system and the surroundings. The Key Concepts listed for that standard are: Conservation of energy, equilibrium, entropy, potential energy, kinetic energy, open and closed systems. This standard fits exactly into a Chemistry course and should be an Essential Standard for Chemistry.
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The Physical Science Plus (+) Standard for this standard for chemistry should include:  
Analyze and interpret data to quantitatively describe changes in energy within a chemical system.  
Determine the graphical and mathematical relationships between endothermic and exothermic reactions, including bond energy within molecules.  
Analyze and interpret data that two systems with different temperatures that are in thermal contact will exchange energy and that the combined energy of the two systems remains fixed.  
Engage in argument from evidence that chemical systems undergo three main processes that change their energy: heating/cooling, phase transitions, and chemical reactions.

74. I like the concepts that are being addressed (essential & plus). I feel that the content as a whole is solid.
75. In many cases the way the standards, especially the key concepts column, are changed with the internal review the changes cause the standard to be at the incorrect developmental level.  
Key concepts that are listed indicate that students would learn concepts that are not developmentally appropriate for the age group. For example, the key concepts listed for HS+B.L2U2.8 says that the term Calvin cycle and Krebs cycle could be included. Key concept lists would incorrectly mislead teachers to think that these concepts would be appropriate. Students need to know as a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment. The key concepts listed for HS+B.L3U2.15 such as Hardy Weinberg is beyond the level of conceptual understanding that students need to know. Students need to know that environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population. Thus the variation and distribution of traits observed depends on both genetic and environmental factors. The section of the standards titled Evolution, are missing key learning progressions that all students should know. Students should know that changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline- and sometimes the extinction- of some species. They also need to know that the process of evolution primarily results from natural selection. The language within the standard says may and that is not the case. Students also need to know that DNA sequences vary among species and that there are many overlaps. Multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Similarities and differences can also be compared by examining amino acid sequences, anatomical and embryological evidence.
76. I see several things missing from these standards, particularly in 2nd grade. I don't see any mention of the body systems (digestive, circulatory, respiratory) except for a brief overview in Kindergarten. I believe right now 3rd grade does the skeletal system, but I'm not sure on that. I don't see them coming up anywhere in these standards. I also don't see anything related to learning about or using science tools. I don't see any science safety standards. Also missing is anything historically significant such as important scientific contributions/inventions and learning about famous historical figures. I also think that the weather standards need to be back in 2nd grade. It makes much more sense to learn about weather & precipitation when you know about the water cycle and the states of matter (both in 2nd grade).
77. I don't see any science safety standards. Also missing is anything historically significant such as important scientific contributions/inventions and learning about famous historical figures. I also think that the weather standards need to be back in 2nd grade. It makes much more sense to learn about weather & precipitation when you know about the water cycle and the states of matter (both in 2nd grade).
78. It is very clear what to cover.
79. These are not what the committee created
80. It covers what is on our report cards.
81. The breadth of the third grade standards is sufficient; however, there needs to be more depth
82. I would like to see a life science standard that included animals.
83. If anything maybe it's too wide a spectrum. Why include so much earth and space science. I feel the focus should be on life and physical sciences.
84. Earth and Space topics should be separated into two separate standards. It appears in the K-2 and 3-5 standards that there is very little emphasis on the Space part of the topic. This is an area of high interest for elementary students and should have more emphasis.
85. It includes all the sciences
86. A wide variety of topics are covered in each grade level. A more even distribution of earth, life, and physical science would be nice, since this was one of the goals.
87. cross curriculum techniques using non fiction literature is included in the process of the science tandards

88. I would like to see more explanation and examples to the standards
89. I think some of the content gets a bit repetitive. But overall, the standard do a good job of detailing what science teachers should be incorporating into their lessons.
90. How will this standard be taught for 40 minutes a day? I could see it 40 minutes a day for a few weeks for about 2 of the units, but that is about it. Do I need to spend my own money developing activities and finding articles that stretch to fit? Will you be providing design challenge activities that fit with the general idea?
91. The only thing I would change is to include a one-sentence explanation of where that primordial one-celled life form came from, through chemical adaptations within organic molecules.
92. No. Standards need more details and a curriculum should be part of the standards. If we do not understand specifically what is being tested or required, it is hard to accomplish success.
- In the section "Key concepts include but not limited to," the information provided is too brief and some not correct. For example, in the third grade regarding 3.L1.U1.5 it states "Review of content taught in 2.L2U1.10 and body systems of the muscular system, skeletal system, nervous system (see eye and ear in physical science; 3.P2U1.1 light and 3.P2U2.2 sound), the organization of cells, tissues, organs, organ systems" However, the standard 2.L2U1.10 refers to the sun as energy source. Additionally, the lack of information in 3.L1U2.6 is referring to adaptations but the section that talks about key concepts list only "Classification systems, herbivore, carnivore, omnivore." This is not sufficient in what SHOULD be included as I read the standard.
93. Complexity and rigor builds over the grade level bands as the same content areas are revisited and examined more closely.
94. They cover all the big ideas that we want kids to know however the last life science big idea needs to go back to the original big idea for the research document.
95. Most cover big ideas we want students to learn but the last life science big idea needs to go back to original big idea from the research document.
96. The verbiage is confusing as to what is expected for students to know for the general science test and the courses. It is also confusing as to how in depth a student needs to know for the general test.
97. I think less breadth and more depth is what is needed. All of the standards that are presented don't have to be covered in one course.
98. Too much.
99. The changes made by ADE should be restored to what the experts in the field had, except if it is a grammatical error. The Key Concepts added by ADE limit the breadth of content.
100. From K - 12, the breadth of content seems varied and relevant.
101. Very general. How will consistency across teaching styles will match.
102. I feel that the breadth of the content is good
103. Depth is ok, Think the younger grades are too deep as they don't have a good background to build on. Better
104. The Science Standards are extremely broad. They should include the scientists who should be mentioned in each standard.
105. When the "Key Concepts" states to refer to standard, it should offer more in depth explanation. The standard is broad, so teachers cannot refer to the standard for a full explanation of the standard. It would not offer success to students if the teacher does not have a clear explanation of what is expected.
106. Leaves a lot of room to do what teachers are willing to do within the standards
107. The standards are not focused and too extensive. They leave a lot of pieces out. For example engineering is a focal point in 8th grade but physics has been removed from the standards.
108. I find that the standards, particularly in the 6-8 grade levels, are very board and not specific. It would be helpful if examples could be provided as to what learning activities students could be participating in.
109. The set up allows for us to take our time and reteach as necessary
110. Seems very vague
111. Our team thought that the "key concepts..." listed information but didn't really go into much detail.

- I would like to see more standards directly aligned with environmental science. Some are definitely,
112. wrapped up in the life, chemical, and earth science areas. However, I would like to see a specific addressing of standards in this area as a separate domain.
- Breadth of content leaves much to interpretation and the imagination. Will this imply a great deal of latitude on the teacher's part or are there specific outcomes to be expected? Some areas are more specific than others (for example, genetics 8.L3U1.9 is very specific, while homeostasis 7.L1U3.8 is quite vague).
- 113.
114. It is similar to what we taught this year, and seems developmentally appropriate.
115. I feel like the standards are more simplified....but human body should be removed.
116. The standard are very broad in what a teacher can or will teach.
117. There is sufficient breadth of content.
118. I did not see much that connects with light, which I feel is important.
119. To broad- too many concepts are being introduced at a very basic level at each grade. Instead, fewer concepts should be introduced with more depth.
- The content is not well organized. The content jumps around to different standards between unrelated concepts so students do not get make as many connections or build on prior knowlege from other concepts. It just does not make a lot of sense to teach so Earth Science, Life Science and Physical Science in one year. Teachers should just focus on concepts that are more related ot each other.
- 120.
- The sought-after shifts in science education as charged to the science standards committee focused
121. on few, broader standards to allow for greater depth, more connections, deeper understanding, and more applications of content.
122. I feel that some of the grade levels like 6th don't have enough content to cover the full quarters, while 7th grade has too much content to cover.
123. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
124. covers multiple aspects of science at each grade level
- Most voters (56%), believe science education in the United States ranks behind most other countries; Voters are virtually unanimous — 97% — in believing that improving the quality of science education is important to the United States' ability to compete globally. Adoption the Next Gen Science Standards is a concrete way to improve our STEM education for everyone.
- 125.
126. They do not cover Scientific Inquiry for my grade level (6th) which is a critical part of science studies!
127. Too broad for pre-university students - stick to basics for a fundamental understanding first.
128. Everything talked about in detail
129. It just has vocabulary implemented on the standards. With no explanation on how to use them or in what context
130. They are challenging for this age group. We feel we can introduce these concepts, but with how many we are supposed to teach, we will not be able to have all students master all concepts.
131. They need to entail clearly defined examples and characteristics of what was actually taught.
- Elementary teachers don't have the background knowledge to teach some of these concepts. I don't
132. want to teach my kids something wrong because I don't have specific training and I don't want to teach them wrong for when they get older and confuse them.
133. Elementary teachers Do NOT have the training required for some of these concepts. We do not have the specific content background necessary to teach this.
134. I like that the new standards allow for a more liberating teaching experience.
- They need to entail clearly defined examples and characteristics of what is to be taught. Just writing
135. "refer to standard" in the key concept portion does not help...give a definite example. Too vague! Tell me what to teach, I don't want to recreate the wheel.
- Again, the breadth is almost too much. Previous standards were more specific. While I realize it
136. narrowed our focus and didn't allow us to "dig deeper", these standards are more vague, in my opinion.
137. The standards are simplified but still give key concepts that need to be taught. Teachers are not limited by the standards and therefore student learning will increase.



138. Simplified yet give key concepts  
This is specifically about the Earth and Space standards. There are only two overarching standards, that are supposed to cover all things earth and space.
139. Interesting that at university, you can major in three science subjects: geology, meteorology or astronomy...but it is hard to see that in these standards.
140. The two core ideas for Earth Science are certainly broad...depending on how much you read into them. Or you could make them very narrow depending on your interpretation.
141. I am not clear on how a Kindergartener would investigate vibrations- perhaps examples of how this standard can be taught can be incorporated in the standards.
142. Neutral on this subject.  
The actual standards contain breadth of content to be taught in the allocated time for each year.
143. When ADE staff added key concepts to the standards, it narrowed the scope of the content to specific (and not always appropriate) components of the standards. Please remove the Key concepts so that appropriate breadth of content is retained.
144. Where is the engineering and computer science for at least grades 4-6? This is disappointing to not have these highly applicable and current fields...most creative and future focused fields in our schools so our students can be best prepared for the future work force! I'm happy that our school at least has PLTW and some STEM for our students, but feel bad for other schools.
145. The Board of Education's Internal Review of the Standards changed the standards by adding the "Key Concepts" to the original standards created by the committee of professionals before Diane Douglas took them for internal review. This significantly decreases the breadth of content of the standards to the point that teachers will ONLY teach the Key concepts.
146. The new standards appear to assume that exposure to core knowledge in one year means mastery and therefore repetition of content with added depth is not sequentially integrated across grade levels. The core content appears limited in each of the three divisions of science content.
147. I believe the breadth of the content is well done
148. I am only referring those science standards that were developed by the committee not the additional words/comments/ideas.
149. A lot of content but the standards jump all over the place. I personally like how the standards are content specific currently.
150. There is very little direction given as to what needs to be taught within the concepts.
151. Evolution section is weak and watered down. It needs to be strengthened.
152. Light on earth science
153. I am wondering if we will be given a curriculum to use so that I can teach these new standards?
154. They are good to go.
155. Please don't decrease evolution teachings in the classroom.
156. In physics the concepts are comprehensive for students enrolling in both AP 1 and 2. It might be helpful to distinguish the content for each course.
157. By removing or minimizing references to evolution, natural selection, the big bang theory, climate change, etc., the new DRAFT largely ignores our current understanding of science.
158. Some content is inaccurate. For example, in 4th grade it says electricity and magnetism are forms of energy and they are not.
159. Fine
160. The breadth is too wide to allow for sufficient coverage of each concept  
These are standards that our kids will not be able to achieve. Many of our kids at my district have not had any science so therefore they know nothing and they will need to have prior knowledge but they do not
161. Earth science is very heavy on environmental science which is great, but doesn't leave much for earth science.
162. What about species evolution and the Big Bang theory? Why are we excluding the science behind the origin of our world and how humans came to exist?
163. Evolution and the Big Bang Theory need to be included.
- 164.



165. Taking out Evolution and the Big Bang theory just makes NO sense whatsoever. Again, let actual scientists and science teachers write the standards, not bureaucrats who know nothing about science and don't believe in established scientific theories and FACT.
166. Evolution and Big Bang theory are not represented properly and the age of the earth is falsely stated.
167. It is important that AZ students be knowledgeable about fundamental science if they are to be ready for college & careers. That includes teaching about the theory of evolution and the big bang. Eliminating these fundamental concepts from our states science standards is an embarrassing and regressive move that will set our students back.
168. it encompasses some content that was not covered in current standards.
169. I'm a grandmother as well as a concerned citizen and a geologist who spent over 25 years in the field of marine geological research (Deep Sea Drilling Project and the Ocean Drilling Program). Our main areas of research include climate studies, tectonics, evolution (paleobiology, stratigraphy, geomicrobiology, mass extinctions, etc), geochemistry. I am shocked that the proposed AZ Science Standards include no mention of global warming and a minor and insignificant mention of climate change. This is shameful, especially since the next generation of school children will be the ones left to understand and deal with the effects of global warming/climate change. In addition, as someone who has seen evolution being put to the test in the field by watching paleontologists in action, I find it absurd that most references to "evolution" are crossed out or diluted in meaning. Arizona cannot expect it's poorly funded teachers and schools to excel, especially when the teachers are not encouraged to teach the fundamentals of science, fundamentals that serve as the bedrock foundation for science in the real world.
170. I believe that we can not delete scientific knowledge just because some do not believe in it. The range of what the students would be learning is miniscule to what they should be taught.
171. Language has been eliminated referring to evolution- an accepted scientific theory. To not expect AZ students to learn about evolution puts them at a disadvantage in AP testing, college education and beyond.
172. They do not explore evolution and big bang theory....a scientific reality
173. The anti science ideas present are a detriment to all students now and in the future.
174. It is concerning that the words evolution and 'big bang theory' have been stricken from the standards. Both of these terms are widely accepted in the scientific community and any attempt to remove them is to remove validity from the standards. There is no reason, beyond personal religious beliefs, to remove such verbiage, and to do so violates the US constitution.
175. Evolution CANNOT be wiped from science curriculum
176. I do feel like there is a sufficient breadth of content, but I do not understand or agree with the removal of the terms evolution on pages 44, 62, and 69 in the internal review draft.
177. Why on earth have you removed references to evolution and the big bang theory???
178. I strongly disagree with removing evolution and The Big Bang Theory. Science is science, so please do not try to use a book written around 900AD to influence the learning of my children. We evolved.
179. The breadth is there, depth may be an issue considering the placement of some conceptually difficult areas in K and the lower grades. May just get a mention with out students getting conceptual understanding.
180. Very hard to agree if the breadth of content is reasonable because of the nature of the content.
181. They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.
182. The National science education standard are better.
183. There seems to be a lack of information on evolution, the foundation of the life sciences.
184. Perhaps there needs to be a stronger look at how a particular standard evolves over the grade levels, and grade level bands. There seems to be some repeat standards without increase in DOK.
185. Why are the big bang theory and evolution being categorically removed? This is a tool to teach science, not religion.
186. Any portion of oceanography is missing. It is imperative that it be taught as the oceans are essential to life, weather, and climate.

On p.62, replace theories with the Big Bang theory as first written. It appears to have been taken out.

- It is the only acceptable SCIENTIFIC theory and should be taught specifically in an Earth Science class.
- P.69 - Replace the word evolution back into the document as previously written. There is no viable reason to remove such a word and evolution is an important concept to understand, especially the concept of common ancestry (often mistaken for decendence).
187. The standards are missing important integration of technology and engineering, both essential for student understanding and application of the conceptual portions of science.
188. No cmments
189. Still have no comparative anatomy of living organisms... just calling it "patterns" isn't sufficient.
190. There is no mention of the scientifically accepted concepts of evolution or natural selection. These are core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.
191. I feel that the new standards have been watered down and do not accurately teach real science concepts like evolution and Big Bang theory.
192. Pleased that Physical, Chemical, Life, Earth and Space Standards are still articulated to some degree because I feel that is how most folks understand them.
193. The breadth across 3 different science disciplines seems adequate.
194. Although there is a wide range, it is too vague to be sufficient for putting into practice.
195. I teach 6th grade physics at a STEM-focused charter school. Our curriculum covers far more topics than this draft, but I see the most excitement from students when teachers are allowed the flexibility to explore their own favorite topics. I personally love to include lessons about energy propagation as waves, light and sound. My students are so enthusiastic during those discussions and explorations. I would not want this new standard to stifle the topics that teachers have seen foster excitement and passion in their own classrooms each year.
196. n/a
197. Regarding the Life Science Standards, there is insufficient breadth of content in evolution, genetics, biochemistry, and ecology. Evolution is completely basic and should include population genetics, the actual term "evolution" and natural selection. Genetics does not even include meiosis, genetic diversity or timing of gene expression. These should all be added along with protein synthesis at its very basic level. The flow of information cannot be taught without a complete pathway and understanding of the connections between biological processes.
198. These don't address evolution or the Big Bang Theory.
199. I don't understand why evolution is crossed out - it is scientific fact and needs to be taught in school.
200. It seems to be a broad brush approach to what shows up in the media or political world rather than a serious attempt to develop a true earth science curriculum.
201. The "Earth and Space Science" standards are lacking content.
202. I actually think it is too much if the goal is to take a comprehensive science test at the end of Junior/11th grade year.
203. I believe the standards are very specific now. Though they are more focused and refined than the older standards, unfortunately, this does not leave a lot of room for creativity for the teacher, as the standards have become very specific.
204. The watering down of evolution is troubling. Please develop national standards.
205. Unhappy with evolution information.
206. The concepts addressed seem good but it appears there are some attempts to "water down" or deny evolution. I do NOT agree with this.
207. I feel like content should include more topics.
208. The standards in several of the grade levels are far too wide. Especially in the grade levels that are tested, for example 5th and 8th grade. In these grade levels, for student success, teachers are going to not only teach their new standards but spend some time reviewing previous standards. Otherwise how could we help ensure the success of all students including those that have moved in from other states.
209. The idea with restructuring our standards was to give greater depth not breadth. The breadth for 8th

- grade is too great to complete before the standardized test in April. Students will not have a true depth of knowledge just a glossed over version due too many standards being taught.
210. Yes BUT STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
- The proposed 6th grade science standards with the added key concepts have too much breadth.
211. Students who learn using these standards will become encyclopedias of vocabulary, yet they will not understand the concepts. There are way to many standards to teach them effectively.
212. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
- I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.
- 213.
214. There is plenty of content overall, but at some grade levels it seems to be less content than there was before.
- Its too broad. A mile wide and inch deep approach to teaching science makes it boring to learn and teach, not to mention it doesn't give students a deeper understanding of the nature of science as a way of knowing or enough experience in critical thinking.
- 215.
216. The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.
- There is no mention of the words climate change in the standards. This is unacceptable because it is one of the biggest challenges future generations will face. Pretending this problem doesn't exist isn't going to prepare our young people to tackle it.
- 217.
218. Religion is not science. Please teach evolution as has been proven in the scientific community.
219. You cannot remove key vocabulary like "evolution" from science standards. The theory that unifies all life sciences cannot be removed to satisfy a belief system.
220. Breadth is sufficient.
- I teach AP Biology and if you take out evolution from the standards - you've taken out one fourth of the content for the AP Biology Exam. In addition, the big bang is also one of my standards. Why the anti-science take on science standards? Evolution and the big bang are very real theories and that is our job to educate.
- 221.
222. Seriously, evolution is a real science topic, not the religious version of intelligent design. Stop pushing your religion into public education!
223. More emphasis needs to be made on how all of the content influences evolution.
224. It's fine.
225. Keep evolution in our schools, we are doing a disservice to our children and they will be left behind in the scientific community by removing these basic ideas.
- Randomly Deleting core scientific information about how the planet formed based on the well documented doppler effect (Big Bang Theory) and universallly accepted science of DNA and evolution is completely unacceptable!
- 226.
227. Why are you removing basic scientific concepts like evolution and the big bang? Do you want AZ students to enter the global economy with a handicap?
228. Evolution of Homo sapiens needs to be taught as evidenced by fossil record Ian's DNA
229. The lack of proper discussion of evolution is disgraceful and disadvantages our students
230. Too heavily focused on vocabulary as well as superficial learning versus exploring. Lacking concrete scientific theories such as evolution and it's role in biodiversity.
231. I have great difficulty accepting some of the following modifications:  
Category L-4 should not exist. It is non-scientific

- Eliminating the term Scientific Method is ludicrous.  
Should not eliminate the term Natural Selection.  
At what level of Biology is healthy sex discussed?
232. Evolution should not be glossed over as it seems to be. The standards must reflect the content that students need to learn accurately so as to properly prepare students for the future.
233. A wide variety of content is important to touch on for this age population
234. I don't understand why the verbiage about the sun has been crossed out in the summary paragraphs, but was happy to see it more generally stated in the charts.
235. Teach evolution and medically-accurate, age-appropriate sexual health education. Leave theology and religious doctrine out of science classrooms.
236. Downplaying the FACTS of EVOLUTION is not "science." It is not your job to advance the religious nonsense pushed by the AZ Republican Party. Your job is to make certain FACTS and SCIENCE are taught throughout AZ's PUBLIC schools. Parents who are made sad by science & facts may place their children in PRIVATE, religious schools.
- It appears as though there are mixed messages with the high school standards. In grades k-8, standards are proscribed by grade level. In high school the intent was for districts to have the choice as to how they put standards together to make a course. The sheer number and complexity of the high school essential standards requires an integrated science course in order to teach all of these standards. There are many standards that cannot be easily integrated into other courses. For example, "HS.P2U3.6 Investigate and communicate how fields (electric, gravitational, magnetic) are utilized and how they influence the structure and function of different technologies" is not a standard that could be easily incorporated into a Biology, Chemistry or Earth Science course. Physics teachers are hard to hire and retain, so it is unlikely that all students will have access to a high school Physics course.
237. "HS.P3U2.7 Develop a mathematical model, using Newton's laws, to predict the change in motion of an object or system in one dimension." could be integrated into the Astronomy portion of an Earth Science course, but what about students who do not take that course? We would have to cram 4 courses of standards into 3 years of instruction. Similarly, in Chemistry "HS.P1U1.4 Plan and carry out investigations to explore the cause and effect relationship between reaction rate factors., HS.P1U4.3 Engage in argument from evidence about how the use of chemical reactions have has positive and negative ethical, social, economic, and/or political implications., and HS.P1U1.2 Describe patterns in the transfer or sharing of electrons to predict the formation of ions, molecules, and compounds in both natural and synthetic processes. Would not easily assimilate into Biology, Earth Science or Physics.
- I am not happy to see so many of the standards that used to be covered by 8th grade get moved down to 7th, such as Newton's Laws. It was always nice to have a bit of biology, chemistry, and physics introduced to students before they went to high school. Now there seems to be standards for Earth Science that used to belong to 7th grade. Won't these be a repeat for those students that already have been exposed to this the previous year?
238. physics introduced to students before they went to high school. Now there seems to be standards for Earth Science that used to belong to 7th grade. Won't these be a repeat for those students that already have been exposed to this the previous year?
239. The fact that it is a science standard and barely touches evolution is absurd.
240. It seems sufficient for each area at each grade level - not too much to dilute everything into a soupy mess.
241. NA
242. I see some of the most basic concepts in science, including evolution, and the big bang theory have been crossed out. Parochial religious views should not dictate science standards. Our state and country will not be able to compete in the future, by teaching watered down science standards. Put them back.
243. There is much room for expansion on the breadth of content, but in general the coverage is adequate.
244. Keep Diane Douglas out of this process!
245. It is impossible to have rigor and adequately prepare students for higher education and the workforce without fully acknowledging science and the accepted and established role of evolution. How can we compete in the global economy when beliefs are substituted for academic knowledge. You do not need to hide, protect or sneak in the truth. Critical thinking and the standard of science will enable students to discern the truth.
246. Important topics that are omitted include definitions of various forms of evolution (change over time, microevolution, macroevolution), teleological (design) explanations for the diversity of life, description of the Darwinian mechanism for evolution, explanations for the origin of life, specific theories for the origin of the universe, and descriptions of operational and historical sciences.
247. The content is spread far apart that students will not be able to make connections between concepts

- and within years apart
248. The concept of evolution is essential to include in the life science standards! It cannot be removed.
249. I would hope that the classroom teachers would go beyond the standards and teach more science concepts than just the ones listed for their grade level.
250. Overall the range of topics is sufficient.
251. Very concerned with attempts to take away from research proven and injection of religious beliefs
252. The breadth of content is quite large. I am concerned that it will be difficult to determine testing preparedness based on individual school implementation. Will any guidelines on testing topics/limitations be given or will the key concepts column be the only indicator?
253. see above
254. I would have liked more information with each standard, such as an exemplar lesson, or excelling level student work/proficient level work etc to see better what exactly can be done with these standards. That has been the issue in previous AZ standards, the written standard itself needed so much interpretation and decisions made on how exactly to teach it. It left a huge room for differences in opinion and caused problems.
255. Again, evolution requirements are being removed from science requirements. This subject absolutely has to be there.
256. As with our previous standards, I am legitimately concerned about bits and pieces of scientific disciplines being scattered around the middle grades. I realize the "plan" is to "spiral" the content yearly, however, that only works when students are in the same school for all 3 years with a highly qualified science teacher. Students who move schools, move states or have a long term sub wind up missing chunks of content that the higher level teachers have to play "catchup" with. A year of Physical Science, year of Life Science and year of Earth/Space Science allow teachers to dive into topics for the year with little interference from previous learning gaps and build a strong base of knowledge in that area.
257. Also, I don't see any of the "Strand 1" style skills being addressed, which were a bugger to "weave into" our instruction, but definitely an integral part of building life long consumers of scientific information.
258. Earth and space science is very limited. Also, some elementary standards written for physical and Earth sciences are actually biological sciences (see Kindergarten (physical), first grade (Earth), third grade (why just limit to human eyes and ears - should be about how light and sound behave), and fourth grade (physical science is inaccurate - magnetism and electricity are not forms of energy))
259. Too many standards and some standards are for AP Physics
260. my concern is that schools can offer less instruction than standard
261. Content is lacking in some key fundamentals. Please stop just glossing over evolution just because it doesn't fit the underlying religious agenda.
262. I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
263. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
264. As sent by the 111 science specialists in November 2017 (left unchanged).
265. The changes are unacceptable.
266. The content is spread over grade levels, but the content does not correspond to the developmental learning ability of all grade levels. Concepts are too hard for younger grade levels and too much is put into 6th grade.
267. The removal of vital information does NOT contain sufficient breadth of content.
268. Needs to go back to review.
269. Keep religious beliefs about evolution and climate change out of science standards. These are scientific principles supported by enormous evidence, and should not be weakened or diluted.
270. Evolution should be included.
271. The standards must be reviewed to reflect a wider breadth of content.



270. In the elementary grades there is almost no study of the human body outside 3rd grade. There are standards for plant and animal cells and genetics, but no study of organs or organ systems.
271. Please send back to committee
272. Evolution should not be removed from the curriculum. Science is not political; it is based on facts.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is
273. also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution.
274. I cannot believe that there are edits to evolution. This is a clear attempt to violate the Establishment Clause of the Constitution.
275. Science standards should be based on science, not a religious slant.
276. There is important environmental and evolution content that has been changed or is missing.  
The deletion of facts from science is disturbing and is a major disservice to the children of this state.
277. This is a great way to prevent technical jobs from coming to this state where the people are under qualified after receiving a sub-standard science education.
278. Needs review  
You seem to have left out current science issues like say, global warming/climate change? Evolution
279. has zero mention as well. Evolution simply means Change over time. Why are our politicians so threatened by that?
280. They seem to have gaps that do not flow well  
Why is evolution missing from the standards? Being an educated engineer I find the terminology utilized and the elimination of evolution ludicrous. This state wants educated people? Stop taking science out of the standards. I am sure Intel, Boeing etc would be very interested in the dumbing
281. down of the Science content. Science industries don't need to be in a state that dumbs down science. What are you people thinking? This needs to be in the media so people are aware of what is happening.
282. Need more real information like climate change and evolution
283. Students need to be exposed to the widest variety of science in order to help potential future scientists see what is available to them.
284. Should be more comprehensive, like Next Generation. Also needs to include evolution and the big bang theory. Those are widely accepted among the scientific community.
285. These standards look like someone had taken a machete to them. Where is evolution day change?
286. Why is evolution not included? Why is struck from the document.
287. My main comment is that the description of evolution throughout the document is inaccurate (see detailed comment below regarding depth and rigor).
288. I am commenting on the DRAFT Science Standards from the Committee NOT as amended by the the ADE staff and Superintendent!  
They have removed information on evolution. You can't teach science with out discussing evolution.
289. Evolution touches every aspect of our lives from how disease form and mutate, to how humans and animals have evolved and changed. Studying evolution has lead us to cure diseases and explain phenomena happening in our world. This needs to be added back in to the standards. Thank you.
290. I have not read the full draft, so have no comment on this  
Evolution is as close to FACT as the scientific community ever gets. Yes it's a "theory," but "theory" in a scientific context means "this explains all the evidence we have, and has made accurate
291. predictions." It NEEDS to be taught in science class, and ridiculous fairy tales like Intelligent Design have NO place in our public schools. Why not teach astrology or alchemy as well? If ID is taught, should we also include the creation stories from hinduism, greek myths, etc? Teach SCIENCE in Science class.
292. Yes, it covers a broad range of core science topics, but it seems a bit too general in some areas.
293. Evolution by means of natural selection must be in the science standards.



294. There is a large amount of content and it seems to relate well to the levels of education that it is addressing.
295. There is a reference to evolution within the Life Science standards (L4) but from what I read, none of the specific grade level K-12 Life Science standards explain or elaborate on evolution.
- Overall the breadth is sufficient. Note: the matrix at the end of each grade band is helpful. Possibly
296. have one for K-12 to see the entire progression. Also, as items are revised in each grade level, the matrix needs to be updated. There are many errors throughout currently.
297. This attempt to place 'religious' teachings in our public school system reads like the "monkey trial in Tennessee years ago!
- It is of utmost importance that science education be rooted in SCIENCE and not in one religion or a
298. another. Creation is not science. Evolution is measurable, observable, and a currently accepted scientific theory, and should be taught in our schools.
- The removal or obfuscation of widely accepted scientific information and theories (e.g. Evolution and Climate Change) is highly disturbing and counter to the fundamental purpose of primary and secondary education - to prepare youth to be active, knowledgable, and productive members of
299. society after they leave school. Censoring valid, peer-reviewed science because of theocratic dogma (especially when not all faiths embrace the same dogma) is only going to accelerate the decline of the United States from being a worldwide leader in innovation and scientific research to becoming eclipsed by most other nations in these areas. Science begets innovation, Innovation begets new jobs, New jobs begets economic prosperity for the future.
- I'm ambivalent here for the reason that the breadth of content is apparent, but the connections between the different content areas is not. Whether a child or an adult, students need reference markers for how the experiment they are conducting fits within a larger scheme. How does the electron driven down a wire to create electricity enable bonding in chemistry? How do the ancestral
300. organism clearly found in different time periods of rock show a pattern of organism adaptation to different environmental conditions also recorded in the geologic layers? How does the Sun's position in the Milky Way demonstrate one of several patterns in galaxy structure? While we definitely need to test per labs the smaller ideas, we also need to help students understand conceptual connection and develop their critical thinking.
- The standards ONCE had strong breadth of content. That was until the Superintendent decided to remove evolution from the standards and instead insert her religious beliefs. I do NOT want my children being taught that evolution is on par with the religious notion of "intelligent design."
301. Evolution is not up for debate, and our Superintendent--who is NOT a scientist and has no training in the profession--should not be messing with these standards to pacify her political base. Stop politicizing curriculum!
- I've read several news stories that you're inserting "intelligent design" and downplaying proven science on origins. This is a VIOLATION of church and state separation. If children are enrolled in a
302. home school or parochial school, fine, teach to church standards. If in public schools or schools supported by public funds, leave religion out of science altogether. It's the job of parents and religious leaders to teach the "intelligent design" or creation story.
- cretinism is not science and it is intrusive and and purposely planned to reintroduce religious opinion
303. into K-12 education and it is a disservice to our students and nations. Without science what do you have. This is an offensive turn of events and one, I believe to be unconstitutional
304. Evolution has been deleted.
- There is no question among scientists regarding evolution. Evidence from so many different fields all
305. confirm evolution. There is no competing theory that is seriously considered by scientists and science teachers. Religion has no place in the classroom, especially the science classroom.
306. Evolution, not creationism, should be taught in all science curriculum.
307. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
308. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
309. Don't adequately explain evolution and the science behind it. Instead focus on a religious explanation in place of science.
310. Adding "both positive and negative" to the U4 core idea obfuscates the idea that some aspects of science are morally ambiguous - it simplifies something that is not simple, possibly to the detriment of student learning.
- The new statement about evolution, L4, softens the language in a way that is inconsistent with the scientific consensus about evolution, and how evolution has caused the unity and diversity of organisms. I think it was phrase better before, and it is odd that in the standards, you refer to the

"theory of evolution" but do not similarly couch other scientific theories, for example, you do not say "the theory of conservation of matter", you just say conservation of matter. It is inappropriate to introduce ambiguity where there isn't ambiguity. Removing the standard about natural selection is inappropriate. It is not clear why the Big Bang Theory is removed from the science standards.

311. Science has no place for religion especially for ignorant fundamentalist religion.
312. Teaching of evolution , as it has been demonstrated and scientifically deemed as fact, Should be continued. Creationism is a theory, based on religious believes and has no place in scientific education.
313. What happened to evolution?
314. Science, facts, theories
315. Sufficient breadth calls for a clear presentation of evolution as a theory not as s hypothesis. A theory is supported by facts.
316. Cutting out Evolution (science) to replace it with faith violates separation of church and state and narrows down the content... it does not provide sufficient content on anything.  
The proposed standards nearly completely overlook evolution. We should be using the Association for Science Education's description of evolution, which is scientifically accurate and pedagogically appropriate. This type of knowledge is critical for a full understanding of biology, as well as for producing students who will be competitive for the biotechnology jobs the state is trying to attract.
317. Send the standards back for review.
318. Not enough explanation of how evolution works.
319. Intelligent Design is not science.
320. It MUST include Evolution, and avoid pseudo-science like so-called "Intelligent Design". (Actually, the latter should simply be called sophistry and lies!)
321. Breadth is good.
322. Religious views should not be taught in public schools  
'Science' is not based on beliefs - It is the observation of fact and data.
323. 'creationism' is not science in any definition of the word.
324. 'creationism' is facts twisted into a form which then backs up individuals' personal belief without education.
325. I am appalled that Diane Douglas has rewritten the science standards to eliminate any reference to the words "evolution" and "evolve". This is absolutely unacceptable in the 21st century.  
I think there is TOO MUCH content for first grade. 1 P2U2.2 and 1L3U2.9 are too complex for first grade. First grade teachers and students would benefit from removing these standards, to allow for more depth in other areas. I really like the kindergarten standards, they are just right for K.
326. To include religious philosophies in any science program undermines the very foundations on which science rests. That is the intent, to cast doubt on the veracity of science in order to create a gap that can be filled with religion, even when religious beliefs have failed to meet the criteria demanded by science.
327. To say that evolution is "just a theory" demonstrates a gross misunderstanding of science. Biological evolution is not "just a theory", it is the most robustly demonstrated theory in all of science. By omitting this fundamental concept and achievement of the scientific method severely disadvantages the children of Arizona. They will not be able to compete with the jobs of tomorrow. Job in bio-science and medicine make money and cure diseases because they are founded on reality: the reality of evolution.
328. Do not let ideology or ignorance hold our future back. Put evolution back into the curriculum. Facts aren't ideology. Evolution is a fact. You test it every time you get a flu vaccine or eat food from plant and animals humans have changed and domesticated over the last 10,000+ years.  
  
Shame on Diane Douglas. Keep your religion out of our schools.  
Removing evolution and the Big Bang from the Science Standards is dumbing down the curriculum to satisfy a narrow sector of the population who does not understand science and evidence. As an
329. Arizona taxpayer, I resent that my hard-earned tax dollars are going to promote creationism and so-called "intelligent design," which have been found by courts (the Supreme Court in the first instance and a Pennsylvania federal court in the second) to be religious dogma and not sciencwe

330. Way too simplified. Rote learning is not the way to go. Inquiry and project based learning should be at the center of focus for any new standard.
331. There is no place in Science Standards for religious-based creationism. Creationism belongs in a class that studies the beliefs of world religions.
332. Evolution needs to be taught as it is a very researched scientific Theory. We need to have quality content in all subject areas to keep up with other states, most of which have much more successful educational systems.
333. It needs to be stronger on real science, not "religious science" which isn't rally science.
334. Any standard that contains creationism, a religious myth with no basis in scientific fact, is automatically inferior. It's a waste of class time to teach a religious doctrine in a required science class and it's a violation of church-state separation to do so.
335. Substitutes religious theory for scientific fact.
336. Removing the word EVOLUTION lessens the specificity of the concept.
336. EVOLUTION being change over time is ESSENTIAL to any basic biology education.  
All things evolve: recipes, cosmetic lines, relationships, and yes GENES!
337. Evolution is important to understand/apply science/engineering principles. Religious \*beliefs\* should not be included in teaching our children about \*science\*. The \*belief\* of intelligent design is not a scientific theory and is not supported by scientific and engineering principles and has no place in a \*science\* class.
338. We need to teach all versions of creation
339. Must contain facts and true science about evolution and not unsubstantiated religious fantasy about intelligent design.
340. Evolution must be clearly included. inintelligent design should not be included in the science standards although it can be included in church and religion classes.
341. You need science teachers making these decisions. You are not qualified.
342. The theory of intelligent design should not be included.
343. Ignorance of evolution is oppression.
344. Where is evolution? You must bring back the words evolution, natural selection, and every other term that is actually scientific. Where is the Big Bang Theory and the age of the universe and the age of the Earth? Where is climate change research? You are leaving out important content for political reasons. My kids deserve to be guaranteed to learn scientific content in their science classes.
345. To remove evolution from a science class shows the lack of intelligence in the education system. I am appalled that it would be removed from the curriculum. Diane Douglas may need to at least start to read National Geographic so that she has some understanding of how the world works. That might be a great place to begin for her.
346. The concept of evolution is an evidence-based proven scientific theory upon which understanding of the natural world is based. The words EVOLUTION and EVOLVE MUST BE INCLUDED in the Science Standards of Arizona's public schools.
347. I find the content lacking and superficial.
348. I am glad to see support for the teaching of creation along with evolution. It would be a poorly educated person who was not aware of both.
349. The breadth of content is fine. HOWEVER, how all the concepts relate together is not clear to new teachers. What is written in this draft is a return to fact specific science which is not how science truly works. It is important for our future science students to see how concepts are part of a system, not separate areas of study.
350. keep your fucking god out of our school
351. The science is missing when the topic of evolution was removed. Our kids need science.
352. You aren't even teaching science if you take out evolution. Religion should only be a part of education if it is a religious studies class.
353. Continue to teach evolutionism- do not remove it to teach creationism
354. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
355. The basis for science standards is the scientific method. There is no scientific basis for testing

- creationism.
356. Please do not remove to concept of evolution from state teaching standards.
- The revision of the science standard to reflect non-science concepts has severely weakened the credibility of the standards. Religion is not science, please restore these standards to the original form
357. and content. Key concept is out of place and a double standard. All references to curriculum were removed from the ELA and Math standards but added in science, why? It appears someone is pushing a certain agenda. Either all disciplines have "key concepts" or none of them should.
358. I think that there is too much information to cover per grade level. I am unsure that the younger students can achieve mastery in some of the elementary standards.
359. The key topic of evolution has been drastically diluted by the excision of the word "evolution" from the Science Standards.
360. The science standards are uneven in the way they represent the content.
361. Not enough about evolution -- a proven scientific subject
- Again, the tenets of scientific method are based on what has proven to be true. We have DNA, we have fossils, we have hard evidence to support what we teach in science. We need to always promote inquiry, but we also need NOT to disregard what we have found through rigor and evidence.
362. Creationism, intelligence design are beliefs and should not find their way into science. Somewhere else, maybe, but not science. Downplaying evolution and designating it a theory without validating its scientific credibility runs counter to what defines science.
- There needs to be greater division between high school topics. To headline just physical and life science does not truly allow each topic to set clear standards. When does chemistry teach a concept and when does physics teach a concept. When does biology teach a concept and when does ecology teach a concept, etc. In high school standards should be topic specific.
363. The tenets of scientific method are based on what has proven to be true. We have DNA, we have fossils, we have hard evidence to support what we teach in science. We need to always promote inquiry, but we also need NOT to disregard what we have found through rigor and evidence.
364. Creationism, intelligence design are beliefs and should not find their way into science. Somewhere else, maybe, but not science. Downplaying evolution and designating it a theory without validating its scientific credibility runs counter to what defines science.
365. Too vague
366. Based on the current state standards where we have an entire evolution unit, I feel a one sentence (strand 4, L4) statement about evolution is too thin.
367. Changing language to deflect from the importance of evolutionary science is downright nonsense. Evolution is a fact!
- The standards seem to be written so broadly as to render them less than useful when applying them to the development of lessons and in being able to properly and comprehensively articulate content to students. Specific content appears to be articulated far better in the plus standards as compared to the essential standards.
368. I'd like them to include science only no pseudoscience.
369. I feel there is too much compacted into each grade level. Too much content to try and cover.
- To eliminate evolution from the science standards promotes the idea that Arizona looks backward to the beginning of the 19th century and promotes the idea that we are a backward thinking people. This is an embarrassment. We should be looking ahead into the rest of the 21st century.
370. See comments below
- Arizona needs to realize that by removing all references to evolution from your state standards that you're doing your children a huge disservice. Even if this is something that many of your politicians disagree with, the majority of the world DOES agree that evolution is real and documented. When your students interact with the rest of the world, you need for them to be as prepared as possible. With the standards written as they are now in this draft, the children of Arizona will be insufficiently prepared for their adult lives.
371. I am dismayed that content relating to evolution and the origin of the universe has been downplayed in the science standards. These observed facts about our world should be taught to students without hesitation.
372. The breath of content seems ok for life sciences for elementary levels, but the revisions in green seem to try to limit it and remove rigor.
373. The new standards are a thinly veiled attempt to bow to the religious right and introduce Creeping

- Creationism into our schools. They insult science and contribute to the negative image of Arizona as an intellectual backwater.
377. I very much enjoy how there less standards at each level. I really like how there is no explicit reference to teaching the Scientific Method!
378. The standards have way too many details - they are a mile wide and an inch deep. It is more important for students to see the big picture than a thousand details.
379. There is no mention of the well excepted scientific theory of evolution.
- The curriculum should include yet unsolved problems for students to think about, such as: Phenotypic complexity (the origin of eyes, ears, body plans, i.e., the anatomical and structural features of living creatures); Phenotypic novelty, i.e., the origin of new forms throughout the history of life (for example, the mammalian radiation some 66 million years ago, in which the major orders of mammals, such as cetaceans, bats, carnivores, enter the fossil record, or even more dramatically, the Cambrian explosion, with most animal body plans appearing more or less without antecedents); and finally, Non-gradual forms or modes of transition, such as abrupt discontinuities in the fossil record between different types.
380. It's another attempt by the religious right to suppress the scientific teaching of evolution in the PUBLIC SCHOOLS.
381. Limiting the discussion of evolution or attempting to call it something else is not being honest with our students. To establish a strong base of knowledge in the STEM fields requires that we be open and honest with the studies.
382. Excluding concepts necessary for understanding from the Standard in order to conform to an Atheistic world view is a violation of the Establishment Clause. One sided explanations that exclude creative intelligence from the origin of life and the World, undermines the moral and emotional foundation of children.
383. The breadth of content is zero, zilch, "nada"
384. The standards strike the requirement to teach about evolution.
385. The National Center for Science Education does not support the removal and changes made to the word "evolution" throughout the DRAFT Science Standards. Evolution should be reinstated in the document, and it should not be described as a "theory."
386. Insufficient detail on the scientific evidence supporting evolution
387. It is too broad, stick to evolution which is supported science.
388. The exclusion and minimization of evolution is a step backward in the understanding and application of science. In science a theory is more powerful than a fact since it is the compilation of factual evidence that makes it a central theme of science and that is what evolution represents. Evolution is the unifying concept of the biological sciences and should be a major topic of study and understanding. No other explanation of how species are created and change over time has a modicum of evidence to be even considered.
389. Takes us back to the darks ages. Insane and unbelievable.
390. TEACH TRUE SCIENCE INCLUDING CLIMATE CHANGE!
391. Comply with scientific fact.
392. New standards are more comprehensive
393. You assume that everyone will go to college. That is a fallacy and harms those who are better suited to other pursuits. How does your curriculum address these students' needs and education?
394. fine
395. There is a significant lack of scientific concepts presented here that will leave Arizona's children severely disadvantaged compared to the United States and the rest of the world. In addition, religion has no place in science classrooms. I am a Catholic, but religion measures the supernatural, science the natural. They are two different things- it would be akin to teaching a student how to measure sound waves with a thermometer. It is nonsensical.
396. Seriously? If this is supposed to be the science your teaching how did the science part get left out?
397. Crossing out evolution is completely inappropriate. Teaching a religious theory along side even more so. Not teaching evolution puts our students massively behind their out of state peers who are getting a full well rounded science education .
- 398.



399. You are crippling Arizona children. How do you expect them to compete with other children from around the world if you downplay evolution?
400. It is important to continuously update science's focus, especially in the face of ongoing research and discovery. This is especially true in molecular biology and in astrophysics.
401. The theory of evolution should absolutely be included in the AZ science standards.
402. As an engineer and science advocate I strongly disagree with the watering down of Evolution and its importance in several branches of science. We should never allow supernatural models to be allowed into public education.
403. I am horrified that religious creationist garbage is being inserted into curriculum by a religious zealot. We do not want to become more uneducated as a nation. Intelligent design has no place in a public school curriculum
404. ok
405. Removal of specific reference to evolution and/or any attempt to conflate religious creation stories with scientific theory is inappropriate. Evolution is the best available scientific theory in support of the origins of biological diversity. Failure to specifically educate about accepted scientific theory is a huge step backward in our educational process.
406. I have looked in the greatest detail at the current draft life science standards for high school students, but looking through the standards for earlier grades it seems that there is an attempt to remove or make less explicit references for how biological diversity arises.
407. Breadth is fine, except the creationism in favor of evolution needs to be deleted as a Christian and having a B.S in Psychology I have studied Biology and Chemistry and believe despite Christian theories, evolution is a non disputable fact. Creationism should only be taught as alternative theory in religious church of the parents choose and Evolution needs to continue to be taught as the only reality in Public schools.
408. Breadth of content needs to reflect scientific consensus, not non-scientists. Encouraging bad science about evolution and Big Bang is a huge problem with the revisions made to the original proposal.
409. Why have almost all references to evolution been redacted? As a college level biology instructor, I can see no reason why it would make sense to remove reference to this key terminology from the science curriculum. Arizona's children do not need to enter college without knowledge of one of the most important and of the biological concepts. Please understand that when we refer to the Theory of Evolution, the term "theory" is not being used to indicate "unproven." Rather, it indicates that the concept is part of a much larger group of tested and testable discoveries.
410. Where is the science about evolution, which students will need to be familiar with to be successful in college level classes, and life?
411. In some areas, the breadth is too broad.
412. The science standards should include more information about the facts of reproduction.
413. Leave well enough alone, God created us, He created knowledge...STOP
414. Needs to include evolution.
415. Too much breadth of spiritual thought over actual scientific information.
416. You have completely falsified evolution by eliminating it. This is not science, this is fake news.
417. I only agree because the standards are not curriculum. Curriculum can take learning beyond the basic standards. Thank goodness the Arizona State Department of Education isn't dictating curriculum.
418. Intelligent design is a religious propaganda not science. Remove it from this standard
419. Treatment of scientific concepts limited to how science helps people make money.
420. Include science facts. Do not include religious conjecture.
421. Sufficient
422. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
423. Teaching creationism in school is an unconstitutional endorsement of religion in tax payer funded public schools. Any effort to introduce this into school curriculum will be met with strong opposition.
424. KEEP EVOLUTION IN THE SCIENCE STANDARDS.



425. We cannot teach intelligent design, we need to teach evolution  
Increasing numbers of scientists from top universities around the world have expressed skepticism that Darwinian evolution can explain the biodiversity of life on earth. Students need to be presented
426. both sides of this controversy and be able to articulate arguments both for and against Darwinian evolution.
427. Adding and maintaining teaching Evolution needs to be continued.
428. It allows for the elimination of biological evolution as a science and replaces it with a religious belief system of 'intelligent design'.
429. Evolution a geology need to be taught as they are understood by modern science, and not as a fundamentalists Christian believes they should be taught.
430. We cannot teach our children adequately by \*removing\* evidence-based science such as evolution from our curriculums. We must SEPARATE church and state and NOT teach RELIGIOUS instruction. I do not appreciate another religion attempting to force bad standards on my children's education. They MUST mention the theory of evolution explicitly, not ignore it or downplay it.
431. L4 "The theory of evolution" should be replaced with the word evolution. Should read" The unity and diversity of living and extinct organisms is the result of evolution." Evolution is a proven scientific core idea, evident in the fossil record and is not a theory.
432. They do not flow in each grade level. They jump from a very detailed standard to unrelated standards.
433. Science should only teach scientific theories based on science. We need to leave religion to the home and church. It has NO PLACE in our publicly funded schools!
434. Deleting evolution from the science standards is ridiculously preposterous and incredibly inappropriate. Doing this makes AZ the laughing stock of the union. It rolls out educational system back even further than we are already are, and wow--are we already behind...
435. Again, I see no reason for major changes.
436. "Theory of intelligent design" should be taught when we start teaching flat earth theory, under false logic.
437. Science standards should not extend to the theory of intelligent design. Intelligent design should probably be taught in "current events" or "civics" or American history....but not science.
438. Evolution is necessary. You can't take science out of science curriculum.
439. Too detailed and not linked to any particular science. Develop ONLY curriculum that can be covered in a 3D model. Inquiry takes time. Don't just throw in words for curriculum.
440. N/A
441. Theory of Evolution is not a guess, there is science to support it.
442. There is a lot to learn and seeing the plan of how to build on top of each grade seems to work nicely  
Arizona students cannot be expected to compete on a world stage if science is dumbed down to meet the comfort zone of uneducated people. The ability to analyze data is core. Also, there is a difference
443. between core and essential, the later being subjective and vulnerable to the whims of those who would twist information to suit their point of view. Core is immutable. Evolution is not some dirty word. It is a body of evidence.
444. The attempt to degrade the concept of evolution to a theoretical concept is unacceptable in light of scientific fact. To allow a theocratic concept to enter children's curriculum under science is backward and undermines scientific reality. Religious beliefs have no place in the scientific classroom.
445. It has an appropriate range of topics.
446. I was happy to see that engineering concepts/process have been added.
447. The rewrite/change on evolution removes breadth of content.
448. See comment #9
449. See comment above
450. The concept that evolution is THE scientific concept that has been built by the scientific method is not an optional teaching requirement for children who will be successful in STEM fields. And must be included.
451. Evolution is mentioned as a theory but any mention of Creation is glaringly absent.

452. The changes made to the science standards, specifically as it relates to evolution, are limiting the breadth of knowledge.  
I strongly support the changes made to the state standards concerning the wording of evolution. There is a difference between micro and macro evolution, and at the very least students should be exposed to the definitions and have the opportunity to decide for themselves whether they believe
453. macro evolution is a viable theory. (And this would be a wonderful higher level thinking activity instead of being spoon fed the "answer.") If Creationism is not allowed to be taught since it supports a belief system, I do not believe macro evolution should be taught as a belief system either.
454. They are satisfactory.
455. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.
456. The breadth of content is not wide enough. The standards should include more objectives related to rocks, minerals and geology of Arizona.
457. The breadth is fine in general , but the obvious effort to sidestep evolution is appalling. it is embarrassing.
458. Science teaching is based on facts-not faith! Content should not be allowed based on options or faith
459. Draft covers wide range of disciplines within the hard sciences. Don't see a lot that is cross discipline yet science is moving that way.
460. Not when content is incorrect!!!, i.e evolution is not a maybe
461. The content should be based on true science not religious beliefs.
462. Politics/religion has no place in science education.
463. Science standards should encourage critical thinking and evaluation of the evidence relating to evolution.
464. Arizona is the copper state and is much about rocks and minerals. The Science Standards should include more material on the subject.  
Adding intelligent design or creation, while removing evolution will give huge disadvantage to young generations of Arizonians, who will not be able to compete with science and technology with
465. graduates from other states. If creation is to be introduced, it belongs to social studies, since it carries absolutely no scientific value or evidence, but it is important part of social life to many Arizonians.  
NO NEED TO ADD CREATIONISM or whatever people want to label it to any classroom science curriculum! Any and all religious based beliefs if taught should be done at home not in public schools.
466. Please refer to the 1987 US Supreme Court ruling in Edwards v. Aguillard and stop this before it cost tax payers tons of money in law suits.
467. The Science standards are compromised by diminishing the role of evolution.
468. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
469. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.  
Superintendent Diane Douglas has removed key scientific concepts from the AZ Science Standards in a misguided attempt to inject her personal religious views into public education for all Arizonans.
470. Standards relating to Evolution and The origin of the universe, specifically the Big Bang, have been corrupted or removed. She should be ashamed.
471. I feel the subject heading provide a broad scope of topics appropriate to give students a solid foundation in science based topics.
472. I mostly agree, although the omission of the word evolution is alarming.
473. Covers most important concepts in science.
474. There is not enough standards covering evolution, life science or health.
475. Choices upon multiple models can't be made upon those which are experimentally proven
476. Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.

Please don't avoid education on evolution.

477. The science standards at points seem overly-specific - I disagree with the statement regarding Standards and Curriculum - the specificity of the standards makes it function as a mandated curriculum.
478. Teach Science, not religion
479. The original structure, before internal review, was a well-organized representation of Arizona science content experts as well as evidence-based concepts.
480. The breadth of content is limited by Diane Douglas disregarding evolution as "a theory" rather than accepting the scientific connotation of the word. Maybe she should consult scientists when dealing with science standards instead of her ancient religious text that expounds on the exploits and adventures of a magical space wizard who sent his magical space wizard son to Earth.
481. The new draft will encourage the broaden intellect and critical thinking of young students with various theories of life.
482. Do not make the changes that dilute evolution from the standards. Students need to be prepared for the world after graduation.
483. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
484. Important subjects have been removed.
485. I am concerned that the content surrounding evolution has been removed and a religious theory has been added.
486. If by breath of content implies to include doubts about evolution and alternative explanations, I disagree with this statement. I iterate that the removal of the word evolution, possibly to cast doubt about its validity, is equivalent to the destruction of basic scientific knowledge for religious beliefs. We live in a society that has advanced thanks to Science, not to religion.
487. Also, if we are to be measured by standardized tests, teachers should have a better idea of what is specifically to be taught, not so many open ended concepts that are "included but not limited to." This wording specifically worries me.
488. Evolution is the science. It should be stressed that there is no evidence-based alternative worthy of even being mentioned in the curriculum.
489. Jesus believed the earth was flat - we don't teach that because it's wrong. Please remove your religious bias and get back to science. Evolution is science...Adam and Eve is wrong (who was having sex for the next generation...brother and sister? Just wrong.)
490. Three sections of 7th grade science are represented well.
491. The relative merits and rigor of different approaches to discovering new knowledge are not adequately addressed. For instance, students will not come away with a strong, personal understanding of how and why observational data has different merits and limitations than experimental data. This is critical to EVERY domain of knowledge, yet is severely lacking in these standards. Also, established knowledge is referred to in the standards, misleadingly, as theories. Not only that, but also the difference between colloquial meaning and scientific meaning of the terms fact and theory are not addressed, and no personal understanding and experience of the differences between those are required for students.
492. The future of our economy and nation will rest on our children having the rigor to design quality experiments, have experience conducting primary research at a young age, and firsthand, hands-on experience with currently cutting edge technologies. Where are the requirements for this?
492. As I said previously, it feels like a bunch of copy and paste for each grade and some slight changes. I understand you may have the "knowledge builds upon itself" concept going here but for 12 years...I don't need to study some of these concepts for 12 years. Everything you cover in those 12 years is what a college student could cover in the easiest, lowest credit, geology, physics, math and English courses in 3 months tops (maybe 6 months if they're a little behind)... I would encourage a "head start" program where student, starting sophomore year, can take classes through the local community college rather than will also meet the high school requirements of curriculum. That way they get an early start on college. Also, the students should take at least 2 classes specific to geology such as economic resources in mining, renewable energy. Also, issues of water should be addressed as this will be a prominent issue in our state in the near future. Most states who have good education systems have some form of state specific earth science/history class which covers topics such as these.
493. see below

494. Intelligent design is not science. I taught science and evolution, and these standards are wrong.  
Both breadth and depth of content need additional age-appropriate emphasis in ecosystems at all grade levels. Especially include concepts such as carrying capacity, living sustainably within an ecosystem, and climate-change science. (BTW, I am a Professor of Natural Resources and with two
495. colleagues [other two middle school and high school teachers] wrote an article entitled "How Well Are You Teaching One of the Most Important Biological Concepts for Humankind? A Call to Action" that was published in the "American Biology Teacher, Volume 78, 2016"). Please see this article for a more detailed explanation of my comments above.
496. Evolution should be taught, clearly, in our schools. Anything otherwise is a violation of the separation of church and state.
497. Evolution is barely mentioned in the life sciences section, and it has a huge impact on that area.  
The language to describe Standards 8.L4U2.12 & HS.L4U3.31 is too vague. The words evolution and
498. natural selection are taken out and more vague language is used. I feel as though this allows for interpretations of proven scientific theories, which is not for public school systems to teach.  
As a retired science teacher I am appalled that State Superintendent Of Education Diane Douglas, believes she has the authority or science knowledge to make any kind of change to the science
499. standards. Especially when the changes she has suggested eliminates proven science, evolution, for theological ideologies.  
Science Standards are for the instruction of science.  
If she feels theology should be taught then create a separate set of standards to address that.
500. Too broad when it equates religious theory with scientifically-based standards.
501. This document does not discuss the critical process of where we came from, the process of evolution, which there is extremely strong evidence for. This is irresponsible and misrepresents It's importance
502. We need evolution taught in AZ.
503. As changed the introduction of intelligent design is not appropriate, return the draft to the one presented by the teachers.  
I have concerns that the overall process by which the standards were revised suffers from a lack of critical input. The inclusion of key concepts did not improve clarity, since these each need exposition
504. and clarification. Broad topics such as "entropy" are the subject of a great deal of work, so it is not clear when a teacher has successfully taught, nor when a student has successfully mastered a topic so broad.  
You cannot teach the theory of evolution without mentioning EVOLUTION. By de-evolving evolution through striking the very word "evolution," this state moves further backwards in its science
505. standards in terms of breadth of content, depth of content and rigor, and the current standard from 2004. THAT'S 14 YEARS AGO IF YOUR MATH ISN'T SO SHARP EITHER. This is a ridiculous change that doesn't follow current science but does follow a political agenda by the State School Superintendent that harms our children.
506. The elimination and downplaying of human evolution cuts out an extraordinarily fundamental part of scientific knowledge.
507. The elimination of evolution is inexcusable. The idea that "creationism" has even been considered for inclusion is ridiculous.  
Any modern scientific standards that ignore major conclusions from scientists about climate change, evolution, and big bang cosmology are not sufficient science standards. These are the conclusive
508. results of the research from the scientific community and cannot be simply ignored because politicians disagree with the scientific findings. It is not their place to choose these standards. The standards should be chosen by qualified individuals with science degrees and backgrounds.  
Again regarding physical sciences, breath of content seems reasonable, although one could argue for different emphases. For instance, two very difficult concepts, both of which are touched upon, should
509. probably be given more emphasis: interaction of electric and magnetic fields and the uncertainties and probabilities involved in quantum theory. These will be important for science folks in college and should give non-science folks some insight into modern physics.  
The articulation of big ideas prevents the standards from becoming a list of facts. However, I think that teachers may need more guidance on how to address these big ideas. Sometimes the individual standards articulate ideas that are so big that it seems they lose their effectiveness (see individual
510. grade level comments). While the addition of the key concepts column seems like an attempt to clarify the content associated with each core idea, unfortunately the list of key concepts reduces the big ideas to a list of topics, which undermines the intent of organizing the standards around the big ideas.

511. Evolution should not be watered down. Use the word
512. I believe the breath is reasonable.
513. Fails to include evolution.
514. Removal/replacement/minimizing evolution is completely unacceptable.
515. I am vehemently opposed to making the proposed changes regarding removing or qualifying the subject of evolution. In no way should this be considered and frankly it makes me consider moving out of this state should this actually occur.
516. Eliminating or limiting mention of evolution in the science standards is extremely detrimental to the success of Arizona students in their future educational endeavors. Evolution is a widely accepted and PROVEN scientific belief about the origin of life in Earth as we know it. Omitting this or not teaching it in its proper manner would create large gaps of knowledge in Arizona students' knowledge, setting them up for difficulty or failure at higher educational levels. It is a disservice to our FUTURES to take this away from them.
517. Going backwards with curriculum is not the answer
518. The contents are accurate so long as evolution is kept in the SCIENCE standards and intelligent design is left out.
519. Content should not include Creationism/Intelligent Design. Science referring to evolving or evolution should be stated as such & not glossed over.
520. Evolution needs to be included
521. There is no reason to take out evolution. It is scientifically based. That is what science standards should be teaching...things based in science.
522. Creationism is not accepted science by any scientists. "Intelligent design" is not a scientific theory. Please do not teach this to our children. Stick to fact-based, evidence based, generally accepted scientific principals.
523. The theory of evolution needs to be taught in school. Colleges expect students understand and be educated on this subject, and so many careers. Deleting the word and using analogies is childish and immature.
524. Teach the scientific facts NOT religious hypotheses & creationist myths.
525. This draft of the science standards weakens the wording of the current standards regarding evolution. Science is clear on this and the original draft should not be weakened to further political or religious goals.
526. I have deep concerns in regard to standards about evolution theory being changed in worded against scientific findings and research. Wording should reflect theory according to scientific method, not that of personal religious veiws. Teachers who teach science should create standards, not people out of the scope of the classroom.
527. Evolution needs to be included in the content. It can't be overlooked and removed. Evolution and a students's Christian beliefs do not have to be separate. It is possible to believe both.
528. I strongly disagree with the removal of reference to evolution. I have studied and taught science for years and believe it should be taught. Evolution is a well substantiated explanation based on a body of facts. Evolution is change in the heritable character is of populations over time and over generations.
529. I appreciate the repetitive emphasis of scientific analysis alongside common sense reasoning to deduce principals of organization of the material world.
530. Breadth of content should also include the proper and commonly know names of historically important scientific theories and the scientists known for the theory. Content should also include how this theory came to be accepted through scientific evidence.
531. I feel as though there needs to be more breadth of content for Life Science Standards at the K-2 level.
532. The breadth of content is appropriate for the type of science education our students need to engage in. As these standards focus on fewer big ideas than in the past, teachers and students can go deeper in content, practice, and make connections between science disciplines.
533. There should be more inclusion about Engineering standards, these are the skills our students need for their future careers. Additionally, standards need to build from one grade level to another.
534. There are many areas of science that are omitted, such as various dating methods and engineering standards. Standards do not consistently build from grade level.



535. Evolution, natural progression of natural science, does not build from grade level to grade level, does not tie in engineering needs integration of engineering throughout the day I do not believe in the progression.
- The breadth is sufficient but the specificity within many of the essential standards is too great. They need to be of a more generalized level of knowledge and understanding for all students to be able to demonstrate mastery of those standards on a standardized state test. Science classes are more
536. compartmentalized. There will be students taking the state test during their junior year that have not addressed some of the standards in depth since their freshman year. The concepts need to be general enough that there is no significant diminishing of knowledge/understanding over a student's time in high school.
- Content pertinent to scientific understanding of the world is being purposefully left out. These
537. concepts that have great deal of empirical and physical evidence in support of need to be taught. Science is about understanding evidence. Not about agreeing with or disagreeing with concepts.
538. to many changes
539. Evolution is science
540. More than enough.
4. The draft standards purport to follow learning progressions. As a learning progressions researcher, I get tired of hearing this because everyone thinks they are using learning progressions when in actuality they rarely use empirically-based learning progressions that connect naïve student ideas to scientific ideas. Instead, they just try to arrange topics in order of increasing sophistication based on the structure of the discipline. John Dewey wrote a whole book on the problems with this approach over 100 years ago (Child and the Curriculum). Even if one accepts that a learning progression could be the placement of more fundamental ideas before more sophisticated ideas, the draft standards do a poor job. For example, 5.P1U1.1 says Analyze and interpret data to explain that matter of any type can be subdivided into particles too small to see (atom) and in a closed system, if properties change or reactions occur, the amount of matter stays the same. This standard combines two big ideas (particulate nature of matter and conservation of matter); they should be two different standards. Then in 6th grade, 6.P1U1.3 states Develop and use models to demonstrate that matter is made up of smaller particles called atoms. It seems that 6.P1U1.3 should be before 5.P1U1.1 and that 5.P1U1.1 should be in 6th grade and just address conservation of matter. As another example, 1.P4U3.4 asks first graders to Design and evaluate solutions to increase or reduce heat from friction between two objects. While first graders can probably observe that friction produces heat, explaining it so that one can design a solution to reduce it might be too complex for first grade. There is no rationale for the order or grade-level placement of some of these standards.
- 541.
- Evolution, climate change, and the age/origin of the universe should be included in our state science standards. Science relies on evidence and reasoning, and these theories are overwhelmingly supported by the evidence. Religion should not be imposed on others. It should be studied and taught separately from the subject of science.
- 542.
543. Yes, it contains enough breadth.
544. Terrible. The standards do not cover topics like evolution at a level that is acceptable. They also suggest that the scientific method is optional.
545. The breadth of content is good.
546. Overall, the standards provide sufficient breadth for each grade level.
547. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
- The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
- 548.
549. There should not be more breadth of content but depth of key scientific concepts and practices that are developed over the K-12 grade span.
550. Without teaching the scientific theory of evolution you are not preparing our students for college and the cutting edge world of modern biology. You might as well skip Newton when teaching physics.
551. Recent changes made by the ADE increase the potential for the breadth to expand into a realm that challenges the separation between Church and State.
552. Maybe breadth OK.



553. The standards are too heavy on Earth and Space and too light on Life Science. 4th grade students grasp biology concepts best. They struggle with concepts that are not as concrete, such as "geosphere, mesosphere, exosphere....etc" The standard for 4.E1U2.6 is not developmentally appropriate for 9-10 year olds. I have been teaching 4th graders at a relatively middle class school for 15 years. The standards that students were able to learn best and keep their interest most engaged was our Ecosystems adaptations/Relationships unit. Atmospheric systems are too far removed for a 4th grader to understand. They struggle to understand weather fronts and air pressure in our current standards.
554. The breadth of content seems quite appropriate.
555. I highly disagree with the attempt to eliminate references to evolution that is a foundational concept in the sciences.
556. There are some key ideas like waves and their applications that are diluted or lost by using the "Big Ideas" document. Key concepts that provide appropriate depth can be found in A Framework for K-12 Science Education. I am also concerned about the treatment of evolution, genetics, and molecular properties. These items are in some cases missing and in others are mis-represented. If presented as they stand in this draft, then students will be inhibited from understanding critical core ideas and it will be difficult for them to understand how to accurately engage in scientific practices.
557. 1. The "key concepts" column effectively narrows the standard to a list of key points for teachers to cover, rather than a robust standard within which students can be challenged.
558. However, they have been changed so that they intentionally strive to MISLEAD and do not represent TRUE science.
559. Excellent breadth to equip students for the future.
560. please leave religious views out of science texts.
561. Original language should remain
562. They cover what what is scientific.
563. Written by quacks
564. They omit evolution.
565. this depends on the subject area. I am Ph. D astronomer: I consider Kepler's laws, to be quite unessential for high school students. But there is NO MENTION of climate change! This is particularly outrageous when the observations of climate change are such textbook examples of many of the concepts being promoted, even in the elementary grades
566. The removal of the term "evolution" from the DRAFT submitted by the qualified educators makes the intended breadth of content of the DRAFT Science Standards less understandable.  
I vehemently disagree with the changes made re: evolution, big bang theory etc.
567. I could not believe the proposed changes-it takes us back decades.
- And keep religion out of the public schools!
568. Since the three 2016 Nobel Prize Winners for Chemistry "proved" (perhaps unintentionally) that super-intelligence is essential for building molecular machinery for cells, the door should be opened for classroom discussion regarding the implications for the cause of life. If super-intelligence (far beyond that of mankind) is essential to build cell-parts, and evolution has no intelligence to use, we are on the threshold of change in the taught cause of life.
569. I am a high school science teacher. You cannot leave out evolution and the big bang and have students understand how the universe works, or be prepared with appropriate background knowledge for a college level science class. Evolution is the unifying theme of all biology, and what everything relates back to. If you leave out the backbone, you just have a lot of random pieces on the table. You have to leave evolution in for the students to have a cohesive whole that is memorable and makes sense. The Big Bang, while still a developing theory as we collect data from the beginning of the universe, is also important for understanding the expansion of the universe and how galaxies and stars behave. Leaving out these two fundamental pieces of scientific knowledge from the standards weakens our science education and programs, and is harmful to our students who will pursue college education.
570. Teach evolution. Evolution is science.
571. Please remove references to creationism from the content. Children need to learn about science and the scientific process rather than being force-fed someone else's religion. Without evolution being

- thoroughly explored, children will lack a basis for other STEM fields as adults.
572. Evolution needs to be presented as a proven theory not as a possible theory of biological change. Creationism has no place in science curriculum.
573. Adding religious content does not improve the understanding of science.
574. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
575. To not include evolutionary theory in basic scientific education is patently criminal. In fact, I am currently a law student at ASU, and the new edits opting towards teaching creationism in public schools are not just assassine, they are illegal and unconstitutional. See *Edwards v. Aguillard*, 482 U.S. 578 (1987). If you do impose such a draconian standard, rest assured that you will face waves of civil rights lawsuits costing this state exorbitant legal fees which should otherwise be directed towards beneficial programs for citizens.
576. Kids should be taught from an early age how to search for and find the answers to their questions and how to evaluate what they find on the internet as being credible. I didn't see anything like that in this draft and think that it should be added.
577. We should remove homeostasis from the middle school standards. Teachers are unsure how to teach it given the gaps students come to us with (most 6th graders have never had a steady science class before) and it's unnecessary. The standard should be changed to involve a more specific focus on anatomy/physiology that allows both students and teachers to take an inquiry-based approach to learning about the human body.
578. I disagree that alterations to the science standards should include creationism (Intelligent Design) within Science standards. Creationism isn't based on scientific facts and is clearly a partisan influence on public education standards. Separation of Church and State must always override the religious bent on history. I urge removal of such language and content from Arizona's Career and College Standards.
579. can't cover everything but an adequate spectrum is present
580. Deemphasizing constellations is wise because the science is simply an example of recognizable patterns. Including cell theory in 6th grade and will provide a good foundation for the introduction of DNA in 8th grade.
- I do hope that all earth processes are implied with plate tectonics.
581. The standards have omitted mention of evolution, a core tenant of science. This is unconscionable.
582. Removing evolution from the standard reduces the breadth of content.
583. There appears to be no teaching of the broad acceptance of a scientific fact even if a small percentage of outlying scientists disagree. If we require 100% scientific community conformity to every established fact, there would be few facts. In that case subjectivity would be the basis for fact, and unfortunately that phenomenon is becoming increasingly evident.
584. the elimination of evolution being a proven scientific concept must be in the curriculum
585. Integration of technology with science content and the nature of science is important. The content for each grade level is managable.
586. The breadth of content is excellent.
587. Evolution is a theory accepted by the overwhelming majority of REAL scientists, and it is doing a grave disservice to young people to remove it from their curriculum.
588. Science standards must reflect true scientific facts
589. Only SCIENCE in Science class!
590. to weaken the teaching of evolution as an important scientific concept is moving our children backward instead of preparing them for higher education or to be contributing members of an educated society. These moves may help explain why the US is falling behind other developed countries in education.
591. Adequate
592. As above
593. The standards appear to provide a sufficient breadth of content.

594. There might be even too much to cover if we want the students to master and be able to use the information in a personal way.
595. Evolution is a fact, not a theory. "Intelligent design" is not proven by any scientific method and should not be included to brainwash our students.  
I strongly support Ms. Baily Hershberger's comments that were made at the Department of Education Arizona Science Standards public review forum on 04/06/2018. The attempt to eliminate mention of how the use of fossil fuels has a negative impact on our environment would be detrimental to our students. We must continue to use science and facts to structure our state's science standards. This is a blatant political attempt to hijack our schools. I also believe these standards should have been developed through a much more open and transparent process. We cannot allow small groups of individuals behind closed door to have such immense influence over what our students will be learning for decades to come.
596. Dilution of evolution and science education will put our students at a disadvantage to this receiving a complete and accurate science education. This represents a state sponsored of religious beliefs and is completely inappropriate and unconstitutional.  
Those writing these standards should be experts in science and/or education.  
At a minimum they should understand what the word "THEORY" means in scientific terms.
- 598.
- Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
599. Intelligent Design has not been subject to the scientific process, therefore isn't appropriate content for the Science Standards.
600. The content overlooks key scientific principles  
The watering down of evolution and the elimination of terms such as "Big Bang" and "Climate Change" put into question the validity of this document as Science Standards based on evidence and make it look more like a belief system without scientific basis.
601. Revisions related to evolutions and related topics are unnecessary, apparently political, and detrimental to the overall quality of education in Arizona.
602. I disagree with it.
603. Fundamentalist religion's ideological lobby is clearly at work making science teaching as narrow and uninformed as possible. "Intelligent design" or creationism is not a broadening of the curriculum; it is an attempt to inject religion where it does not belong. Evolution was theorized in 1859; it is now a fact, proven and challenged and reproven over more than 150 years. Creationism is not a fact or even a theory; it is a dogma, based on the writings or scientifically ignorant tribesmen in the Middle East 2,500 years ago.
604. The content is different than what we have implemented the last time the standards were updated.
605. One needs to know more about the correlation between natural, physical, cultural, social and economic aspects affecting each other.
606. Get rid of "intelligent design." Restore references to evolution.
607. Written by professional science educators.
608. Creationism has NO place in a science classroom. There is 0 evidence.  
The Science Standards do not include sufficient content to educate our Arizona students for a competitive job market. In particular, the standards related to evolution as currently written will fail to provide sufficient understanding to our students of an extremely well-supported tenet of the life sciences that is understood by teachers and students in developed countries around the world. As a result, our students will be entering a STEM workplace without the preparation to excel in the sciences and contribute to advances in medicine and biotechnology, for which evolutionary processes are basic.
609. Without discussion of the most important and well-supported theory in all of the biological sciences, children will be ill-prepared and out-competed  
Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
- 610.
- 611.
- 612.

613. The avoidance of evolution as a topic is appalling. Science should not be taught based on people's biases. Evolution is accepted by the scientific community and is a critical component of scientific training for our students, to properly understand the world and to be accurately prepared for further scientific study. This cornerstone of science cannot be removed from Arizonan education. It is horrifying that this adjustment to our scientific curriculum based on personal opinions of evolution has even been considered. Public education's curriculum must be free of the influence of personal opinions, missy importantly free of the influence of religious opinions. The separation of church and state is crucial to our free and flourishing society and democracy. The scientific curriculum must be unbiased and free of the influence of religious beliefs. The teaching of evolution throughout the k-12 grades must be returned to the curriculum. This attempt to limit our students' proper education of scientific knowledge should never be allowed to occur again.
- Disagree with what is described as the purpose of science in Core Ideas for Using Science U4. It is generally understood that the purpose of science is to "explain phenomena and (sometimes) predict" not necessarily to always "find the cause or causes of phenomena" (although at a broader level that may be one of the goals of science). Suggest retaining original wording.
614. Removal of any discussion of evolution and the role of heredity, adaptation and natural selection in the evolutionary process significantly and irresponsibly reduce the breadth of content in the science standards.
- Similarly changing the worlds "in the Universe" to "in a closed system" decreased the breadth of that big idea in the science standards and needs changed.
615. The breadth of the content is appropriate for K-12
616. Please send it back to be reviewed
617. The science standards are trying to equivocate religious beliefs as truth.m
618. Evolution should be present in the standards.
619. Connecting science lessons to other academic disciplines is an excellent idea.
- Previous comments:
620. The watering down of evolution and the elimination of terms such as "Big Bang" and "Climate Change" put into question the validity of this document as Science Standards based on evidence and make it look more like a belief system without scientific basis.
621. Evolution is not just a theory but an accepted standard among scientists for many years.
- Changing the requirements that students be able to evaluate how inherited traits in a population can lead to evolution is unacceptable. Replacing the word evolution with "Biological Diversity" is unacceptable.
- 622.
623. Not enough specifics in some areas, too broad in other areas
- The shying away from the word "evolution" in the biology standards is a major problem. Evolution is the backbone of so many biological concepts and the theory of evolution has stood through extreme
624. scrutiny. We must teach science in science classrooms and evolution is a well supported scientific theory that should not be hidden or disguised by alternative wording. Weakening it in any way by how we teach it or teaching it alongside non-scientific "theories" is unacceptable.
- Without the ADE changes, I would have marked this strongly agree. I like that the breadth was limited so students could learn concepts (not content) deeply. ADE additions shifted the focus back to
625. mile wide inch deep, with an excessive breadth of content that will distract from the depth of the concepts.
626. Evolution is a scientific fact, without which science standards significantly miss the whole point of science.
627. Standards proposed deny the fact of evolution.
628. Teach evolution
629. A variety of topics are presented and appropriately connected with other academic disciplines; the difficulty level is properly based on the grade level.
- Did not realize in my last review of the standards that evolution was being removed as a way to slip
630. in intelligent design. Keep your religion out of the classroom and don't use my tax money to push your social agendas.

631. Removing evolution from the standards is abhorrent.  
It's factually incorrect to claim evolution is not a proven science. Please do not commit the future
632. students of Arizona to false science education. Evolution is a proven science and should be taught as such.  
Having read through the "standards" twice, with the intent of providing line by line feedback, the
633. breadth of content is minimal at best and admitted to in the documentation. Is this all we really expect our students to know about science? I expect standards to reflect what we need our students to know and understand, not what teachers and others think they know about science.  
The changes made in the standards pertaining to evolution have severely diminished the SCIENTIFIC
634. basis of evolution in favor of inserting the religious ideologies of creationism and intelligent design, an action clearly in violation of the Constitutional prohibition of separation of church and state.  
Absolutely insufficient coverage of biology at earlier stages of education. Genetics and microbiology
635. are the primary areas of biology what people interact with in useful ways in their daily life (ie the doctor, grocery store, etc.).
636. The breadth goes beyond science. Therefore the breadth is wrong.
637. Global warming? Creationism?
638. Excellent.
639. Very wrong not to teach proven Science...
640. The standards cover a wide breadth. Not sure why Arizona could not have just adopted the Next Generation standards. This would have saved a lot of time and money, while still providing for great standards.  
Religion has no place in public education. Evolution is science. Children should be allowed to be
641. taught science as the scientific community sees it. Parents should be able to teach beliefs as there are many different ideologies in existence.  
Evolution is established science and should be taught as such. Biblical creation is a faith-based story,
642. not science. For the sake of our future, it is imperative that evolution be taught in an in-depth and scientifically accurate way.
643. good
644. Please teach evolution and not creationism
645. Good breadth.  
Science content should be strictly based on understandings derived specifically from the study of science. Specific Religious beliefs should be studied in your church. At the most, a optional "Religion"
646. class could be devised to study all of the major religions of the world, but not limited to just one. Arizona has a bad reputation for excellence in education without adding studies to science that are not based on scientific research or fact.
647. Lower grade levels encompass essential/core concepts while HS standards expand them into more comprehensive concepts/content
648. Creation is part of science. There are scientists, well known and regarded who agree.
649. The US court system have determined that intelligent design is not a scientific theory.
650. I think the standards generally have a better approach to breadth than the previous standards.  
There is no guidance as to how highly politicized topics will be taught. There is no need for creationism to be taught in non religious classes. It leaves much room for religious and lobbied
651. interests to enter classrooms and impact the next generation for our folly. It is shameful. Stick to educational basics and elevate our students with a taste of the exciting world of discovery that will soon be theirs.
652. Teach Science
653. There are a lot of different content areas in each grade level, perhaps too much.
654. as I read them on line, I thought they covered content Arizona students should be exposed to
655. The breadth of content of the Science Standards is not the reason for my current comments.
656. Removing evolution from the science curriculum puts all Arizona students at a disadvantage as against students actually taught science. Forcing bad theology on students in the guise of

- questionable science does nothing to promote critical thinking.
657. Science Standards address many fields of science from atoms to plants and stars.
658. too much breadth -- specifically including the ridiculous inclusion of creationism.
659. N/A
660. The concept of evolution being an unproven "theory" and not settled science is nonsense. Get your facts straight and take your religion out of our schools
661. The content is very correct the way it was originally written! The changes made to exclude portions are unacceptable. Educated professionals wrote the original, uneducated politicians should NOT be making changes to things they know nothing about!
662. The current (2004) standards are fine. The proposed changes regarding the removal of "evolution" and "Big Bang Theory" are an affront to intelligent, educated people and these changes have no place in in the Arizona State Science Standards!!
663. I feel that in 4th grade we have more than sufficient. I think it is good that it is being spread more evenly throughout the other grade levels.
664. Replacement of the word evolution effects the breadth of content.
665. It is sufficient.
666. There should not be a lack of teaching of evolution in science classes. Evolution is a universally agreed upon topic that children need to understand. Children in Arizona will be at a disadvantage if they are taught fairy tales and not science. Leave out your religious teachings in PUBLIC SCHOOLS. If you want to learn about creationism go to Sunday School.
667. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
668. You need evolution. We are 48th in education and now we're going to be even lower; it's time to give or kids the opportunity to learn about a multitude of subjects and allow them to make their own decisions on what they choose to believe.
669. I think there is a lot of content in these standards that is necessary, but why are we putting "mitosis" in parenthesis? Instead of just describing what mitosis is, just use the word. People who are teaching these topics will know what mitosis is. Also, why are we getting rid of the "Scientific Method"? This is what is commonly used in schools around the country, and changing it for "science and engineering practices" will be a disservice to Arizona students. I know we want to encourage "science and engineering practices" but there are other ways to do that rather than no longer using the scientific method. Please reconsider this.
670. Remove "seeks to make clear" when describing evolution. Science is not religion.
671. An invasive impediment to science has been removed , namely the the tired old brontosaurus called evolution.
672. I actually think that bringing that much content to elementary level is concerning.
673. There is no place in the study of science to bring in religious ideas. These are two incongruous metatheories that do not need to be confused.
674. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
675. The breadth of content of the standards is generally okay. But there is a mixing up of terms "evolution" and "biological diversity" or "how traits within populations change over time". Evolution should be part of the science curriculum whereas intelligent design should be, for example in a literature or history class.
676. See above
677. Please do NOT make changes that remove or downplay references to evolution and the big bang made by Diane Douglas. These changes, made to support a religious agenda by a person who is on the record as supporting "intelligent design" (which is about as scientific as believing that Mickey Mouse controls the weather) would doing our students a great disservice by removing or mumbling through references to genuine scientific principles and theories. Because they are supported by



rigorous scientific research, data and real-world observation, evolution and the big bang are scientific theories. The "intelligent design" driven Ms. Douglas supports is based on religious beliefs and have no place in public education.

678. The new standards appear to avoid reference to evolution, natural selection, and the big bang theory. In doing so, the standards imply that there may be viable "alternative theories" that carry the same weight as these ideas. These implied alternatives-whether "intelligent design" or other- are beyond the content of science, and belong to the realm of religion and personal belief.

679. Eliminating references to evolution restricts the breadth of content and harkens to the Middle Ages. The US is already behind many of nations in producing graduates who are science-literate and competitive. Stop this nonsense.

The changes to the science standards made by the Superintendent of Public Education during the internal review were not based on scientific knowledge and weakened Arizona students' ability to compete on a global level. There is ample data and empirical evidence for evolution and climate change - and yet the wording was altered without scientific review. The current science standards must not be adopted.

680. Using the current draft, Arizona will have to design its own assessment. Its validity and reliability would not be proven for years (if at all) and would be unique to our state - which offers no basis for comparison with other states' curricula.

I strongly advocate the adoption of the Next Generation Science Standards (NGSS). Arizona participated in the development of the NGSS as one of 26 lead-states in the nation. Arizona stakeholders weighed in during the public review of the NGSS. Let Arizona return to being one of the leaders in our nation, rather than moving our students backward. It's time.

681. Who wrote this? Get some scientists...

682. Should be limited to SCIENCE not religious content

683. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!

684. Evolution has been scientifically proven, so it should be clearly presented.

685. See comments above.

686. We are betraying our children if we allow our elected officials to impose their personal religious beliefs on curriculum.

687. Insufficient emphasis is placed on the actual teaching and mention of evolution, which is central to all of the life sciences. The same is true for the reduced status of the so called Big Bang theory, whose conceptualization offers the best current understanding of astrophysical data. The replacement of these two essential scientific concepts with whatever it is that is being suggested by the last minute strike throughs, is miseducation, not education. There simply is no real substitute for what our kids will need to know about evolution and the Big Bang to further their education in those areas.

Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups. Also, insist that the Superintendent and her Department staff become familiar with the Kitzmiller v. Dover decision on the legal issues with trying to sneak religion into the science classroom under any variant of creationism, including intelligent design.

688. Overly broad to include points that aren't science and fact based. Need to omit faith based preferences.

689. Watering down and removal of the science of evolution in the standards is a major failure.

690. You've eliminated the primary theory on our universe's creation. I think that qualifies as insufficient breadth.

691. Again, Evolution is a major component and religion should be considered privately out of the Public Educational system.

692. The basics students need to know to succeed in college (and in life!) are there, or were prior to removing some of the material about biological evolution.

693. Many key topic are not sufficiently laid out

694. Eliminating reference to the Big Bang Theory is absurd. This is the current accepted understanding of the origins of the universe. If--and this feels like a subtext in the push for unnecessary revision--the concern is that the word "theory" is the problem, it should be understood that various scientific disciplines use vocabulary differently from popular discussion. "Rational" in economics is one,

"Theory" in astrophysics, and indeed ALL science, is another. Do let's be rational in the popular understanding of the word.

695. Breadth already sufficient without change.

The scientific study of biological evolution is required learning for any child to understand the creation of life, adaption of living organisms to their environment throughout history, and laying the ground work for future adaptation of living beings. The proposal is ridiculously limited in scope and I find it personally insulting to suggest that my children are forced to learn something that is only held as a belief or ideology of a minority of religious citizens. NOT one of fact and science. Your religious beliefs will NOT be imposed on others.

696. The standards are vague in scope. Depth of knowledge for each standard is not defined. Teachers will be uncertain on how to assess these standards because of lack of clarity on each objective. Again, not having a scientific method unit is detrimental to students' understanding of science.

697. The breadth content is sufficient.

698. There is too much breadth. It makes it difficult to know exactly what to concentrate on.

699. I think the standards jump around and don't give a natural flow of what needs to be taught.

700. The given key concepts do not cover what is needed for that topic entirely.

701. The breadth of content for 6th grade is limited. I would appreciate more topics or a greater depth of knowledge on these, but I need guidance on how far to take each of the materials.

702. I'm glad to see the breadth of content is expanded; however, I'm afraid I won't be able to teach all the standards do a depth required for understanding.

703. For sixth grade, there appears to only be three "units" which causes me pause and concern considering the amount of time in a school year that needs to be filled. Again, this goes back to the "broadness" issue. Certain topics could take more time or less time depending on the instructor.

704. There is a lot of information that needs to be covered each year, it would be easier and more beneficial if each year the teachers and students could focus on one subject/ field of science instead of multiple.

705. The Essential Standards are too broad in some cases and too specific in others. The standards chosen do not represent the most important, essential parts of what students should know in science 9-12. These need to truly be ESSENTIAL and allow educators to build from there, in more than one class, in the key concept section. Also, the strategy for teaching the content should be separated out from the content itself in the essential standards because it is too confusing. Example: develop a mathematical model using Newton's laws... These should be two different columns of information.

706. In trying to write the Essential standards as 3D, Several are so broad as to be untestable. One example is HS.E1U2.12. By expanding it to include all spheres, a test could deal with biosphere which would not necessarily be taught in Earth Science. It is also unclear what exactly is expected for students to be able to do.

707. There is breadth of content in biology and earth and space Science (with a heavy load placed upon biology). But physics and chemistry are only slightly stressed. Why even put standards for these courses in if they are so minimal? The minimal standards for each makes offering chemistry and physics difficult to do.

708. The drafted standards are very heavy in Earth/Space Science. There are very few appropriately qualified Earth/Space teachers at the high school level. This creates a problem in certification for many current science teachers. There are also a few standards (Kepler's law and nuclear reactions in stars) that are totally unnecessary to teach at any level. There are too many Earth/Space science standards, and very few Chemistry standards. Chemistry tends to be a more rigorous course, and better prepares students for science classes at the university level. These standards also do not take Anatomy and Physiology into account.

709. It seems like some grade levels such as 6th grade has a lot more standards and key concepts. This is difficult because many students come into middle school with very little experience and knowledge of science.

710. Removing Evolution from the standards and allowing "intelligent design" is NOT science.

711. How can science standards contain a sufficient breadth of content if it deletes one of the primary scientific principles? Evolution is not a theory. It is true. Arizona students are competing nationally and internationally and should be taught at the highest standards possible.

712. I would like to see more emphasis on evolution, and mammalian reproductin

713. Looks ok

714. Looks ok

- Referring to evolution as only a "theory" when the vast majority of all biological standards we know and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined.
715. In attempting to limit the study of evolution, the standards do not cover an important scientifically studied area.
716. You need more CREATION teaching!
717. Students should be encouraged to understand the concept of "theory" as used by scientists and learn how scientists draw conclusion. Exploration is more important than memorizing required facts
718. You need to explain and teach FACTUAL science, which includes evolution!
719. See above
720. I have not been able to obtain a copy of the 2018 Draft Standards but based on media reports of the current draft standards under consideration, there are amendments that reflect an imperfect understanding of scientific principles that undermine rigorous teaching of science.
721. it seems age appropriate
722. Keep creationism out of Arizona schools.
- I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK! See my comment above - "You are attempting to muddy the waters and mix religious views with accepted, peer-reviewed science. That is deceitful and misrepresents the best available science." The curriculum should focus on the currently best available science, including up to date, newer textbooks, and the leading studies in all fields of research. Look to your universities! If you wish to interject religious viewpoints, do so in a comparative religious studies program - but keep it separate from science. Allow students to learn and develop informed opinions for themselves. Do you have so little faith in them?
724. NOT if there is any denial or questioning of evidence based scientific information essentially denying biological evolution as just another theory. Scientific theories are not just opinions, beliefs or dogmas but statements based on observation and peer reviewed factual information.
725. DO NOT take the term evolution out of the science standards. Evolution is a fact, proven by multiple disciplines. Diane Douglas' religious beliefs cannot be allowed to dictate the content of the Arizona Science curriculum.
726. The range of content is sufficient.
727. The suggested content changes which replace references to evolution are contrary to a broad understanding of scientific theory.
728. Intelligent Design is not a scientific standard.
729. Evolution is NOT just a theory. It is truth and any attempt at keeping the truth from our young students will delay any great truth that could be found in the future.
730. Needs to retain references to evolution
731. These standards do not go into higher level thinking skills. They are more like just memorizing facts!
732. Do not make any changes to the present content.
733. no comment
734. the attempt to remove references to evolution is revolting and dumbs down our children's education. Education and science specifically should be 100% neutral to religion and religious concepts. An education based upon religious belief sends us back to the stone ages and is not science. Science is science.
735. See comment 13.
736. Not as Douglas would have them read. Let the science professionals write and approve the standards
737. Seems to address relevant issues/data that will adequately prep students for higher learning and encourage further study.
738. The author appears to be making the effort to reduce the breadth of content to further their own anti-science agenda.
- 739.

740. good basis for students to be able to expand into specialized branches.
741. It will not contain evolution if your revisions go through... so it has a narrowed breadth of content.
742. KEEP the word EVOLUTION in the standards. Evolution is accepted science . There are NO alternative theories that are no religiously based.
- Despite individual beliefs evolution needs to be taught in it's entirety. To repeat myself evolution is a
743. proven fact. If I wanted my children taught creationism I'd have sent them to a private religious school.
- It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
744. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
- I didn't see enough on evolution. This is a proven concept in science that is essential to understanding many important concepts in biology and medicine that the kids will see in the news as they grow up.
745. It is something that is often under fire from people with more political and religious organizations so it is something we need to explain thoroughly and correctly from a scientific point of view from a young age. I would also like to see more use of computer programming and analysis where possible since these tools are becoming increasingly available and important for high paying jobs.
746. Again to answer this question is ludicrous as the real issue is regarding one specific part of this entire document. Don't hide what you are attempting to do. Put in plain sight in order to obtain good data.
- Evolution and the Big Bang are essential fundamentals of science education. I have M.S. degree in biology. Replacing the words " can lead to evolution" with "can lead to biological diversity" is
747. inappropriate and these words are not synonyms. They are related concepts. "The theory of evolution seeks to make clear..." Seriously? Why not say that about scientific principle??? You are doing our students a GRAVE DISSERVICE and will scare away businesses such as biotech industry.
748. Creationism is not a science and should not be taught in school
- How can you have breadth of content when your education honcho has no clue what the word
749. "theory" means or how the Scientific Method works and is trying to downplay evolution and natural selection?
- The breadth of content of the science standards should be limited to items that have been studied
750. through the scientific process. A theory in science is not any WAG put forward. A theory is an hypothesis that has been tested to determine that it is not true.
751. No issues
752. It has content that doesn't belong.
753. Needs to directly address evolution.
754. able to prepare students for higher education
755. Religious teachings should not be taught as SCIENCE
756. The more information the better.
757. The breadth of content is very good.
758. Standards must include concepts and evidence related to evolution and adaptation of species.
- On the whole these are OK, but I don't agree that they should include "Quantum model vs Bohr
759. model, electron configurations, quantum theory, uncertainty principle, 4 quantum numbers" for HS physical science.
760. To be successful in tomorrow's world, our Arizona students need to fully understand evolution and the Big Bang.
- The high school "Essential Standards" do not prepare future citizens to face the looming HUGE problems of extreme weather, sea level rise, water shortages, etc. due to climate change. In essential
761. high school standards, emphasize crucial long-term global issues: chiefly man-made climate change.
- The high school biology 'essential' standards should include natural history.
762. There should be more of a focus on Earth & Space Sciences throughout all grade levels - use the Framework for K-12 Science Education to guide the development of ESS concepts through K-12

grades. This discipline of science is commonly neglected and the understanding of natural resources and how humans interact with and impact them is crucial for current and future issues.

763. The watering down of the standards around evolution by natural selection to fit the Superintendent's stated desires regarding introduction of content deemed blatantly religious by the courts, in defiance of the drafting committee and stated positions of major educational and scientific organizations is absolutely stunning, unacceptable, and detrimental to the education of our students and economic development of our state.

764. All efforts are undermined by the insertion of religious bias into what should be a science based standard.

765. The breadth of content seems fine in most categories, but there is concern, at the high school level, in which class will students be learning specific essential standards? How will they be assessed?

766. Science standards need to reflect scientific discovery and inquiry. Student should not be limited by conservative religious belief.

767. Allowing intelligent design to be taught in public schools goes against the separation of church and state and is abhorrent.

768. We need to retain references to and explanation of evolution. Evolution does not deny the existence of God. It is an observable fact. Just look at the bacterial adaptation to antibiotics, which requires us to use stronger and stronger antibiotics. Even the Big Bang required a Higher Power to initiate it. Arizona students deserve to be on an equal footing with students in the rest of the U.S. Evolution is an important factor in our understanding of the world.

769. Removing evolution from curriculum is an extreme political decision rather than a sound educational one. These standards drive the instruction in our public schools where there is a distinct separation of church and state. There is an overwhelming support of the theory of evolution in the scientific community and there is an overwhelming critique of this theory in some religious communities. Such a decision to remove the theory of evolution from curriculum in our public schools is an assertion of religious belief that ultimately is unconstitutional and infringes on the rights of those who do not hold the same religious beliefs. There is no reason why multiple theories cannot be addressed. Creationism fits perfectly in Western Civilization Social Studies courses as it comes from an essential text, The Bible, that greatly influenced the development of the Western Hemisphere. There is no reason both theories cannot be learned together. Learning both theories from these different disciplines helps develop well-rounded, well-educated citizens for our state.

770. This refers to the SS prior to changes made by internal review.

771. Unclear to the boldface words or is this what the students is suppose to do.

772. Evolution must be taught as a scientific fact. Intelligent design (or whatever religious people want to believe) shall be taught in churches or homes. It has NO place in schools.

773. There is NOTHING indicated here that would suggest that science concepts discovered and verified after 1900 are part of the science program: 19th Century Science and Technology will not prepare our AZ youth for their competitive roles in the 21st Century Global Economy. "We are preparing them for careers where the only thing they need to learn is "Do you want fries with that...?"

Some basics seem to be missing in K-12 science curriculum. It's about facts and sometimes it is acceptable to estimate.

The concept of fact, theory, hypothesis and conjecture are missing. Facts don't change or evolve, they simple exist. It is our understanding of facts, developed using some lesser conjecture or guesstimate that may change over time, but the facts remain as they are. I have explained this to many people over decades in engineering. E.g. "My theory is this..." is not a possible concept. Theory has a specific definition, and that is one that includes presenting scientific data and other people duplicating results of those experiments. It's a system that draws out facts and labels the lesser information as not being fully developed. It always surprises me how many engineers don't have a good grasp on this concept. We need to teach this to kids very early in their science education. This is scientific foundation

774. material. <https://www.quora.com/What-is-the-difference-between-Hypothesis-and-Theory> 2.) The other thing that comes to mind is the concept that, in physics, there are no straight lines. And sometimes that is important, other times not so much. Euclid simply defined the shortest distance between two points as a straight line and continued developing geometry. It's a good thing he didn't get caught up in the details of curved space time etc. and created geometry for us instead. Einstein's work with simplified thought experiments would be great for K-12.

[https://en.wikipedia.org/wiki/Einstein%27s\\_thought\\_experiments](https://en.wikipedia.org/wiki/Einstein%27s_thought_experiments) I'm not suggesting these specific thought experiments, but the concept of thought experiments where the actual experiment would be difficult or impossible to perform would be very useful in the k-12 kids scientific thought processes. It's about Use these to get past impossible to test concepts and continue thinking about a certain subject. It takes a young mind to easily learn these concepts.



775. It is absolutely scandalous that religious indoctrination called "intelligent" design is being incorporated in the revised Arizona 2018 Science Standards Draft.  
Creationism must not be taught in public schools! It has nothing to do with science and instead is an ideology that refuses to acknowledge several centuries of solid scientific evidence now well established. So-called "intelligent" design is prejudiced, it takes a preconceived dogmas as pre-established fact.
776. please do not put religion in public schools.  
if we wanted them to learn about religion we'd send them to a religious school.
777. No Comment
778. Break down of topics is adequate.  
I do see evolution still included in HS. L4U2.31
779. It is great to include the core concepts, science and engineering practices, and the crosscutting concepts.
780. Critical aspects of biology (evolution) and astrophysics (big bang theory) are being removed.
781. Evolution is only a theory. You need to include the concept of Intelligent Design.  
I disagree with the removal of the language surrounding evolution in the high school science
782. standards. Evolution is scientifically proven, and we disadvantage our students that are heading into higher education by not educating them on a scientific standard.
783. Religion has no place in the classroom that is why we have a separation of church and state.
784. No evolution? What? Please!
785. I appreciate that through process Standards a variety of science topics could be investigated at once in a classroom.
786. **[No Answer Entered]**
787. None
788. The science standards in terms of breath of content is broad enough for students to tackle real-world problems and be able to communicate using the science jargon.
789. The words "evolution/evolve" are a necessary part of teaching biology. It is not taught as the end-all-be-all, but it should not be excluded in fear of infringing upon religious beliefs.  
The internal review AZ standards on page 69 reads, HS.E2U2.17 Analyze, interpret, and critique \*supporting evidence for the Big Bang theory and the scale of the Universe\*
790. theories related to the scale and expansion of the universe with every word between the asterisk deleted. However, on page 79 it reads, "L4: The theory of evolution seeks to make clear the unity and diversity of organisms, living and extinct, is the result of evolution organisms. The theory of evolution seeks to make clear...is included. Why are you leaving out the theory of evolution on page 62?
791. Does not need any non scientific hypothesis such as creationism
792. There is an unequal distributing of standards between content areas. Some courses will be difficult to complete in one school year.  
Evolution and the "Big Bang" should not be eliminated. In order to pursue advanced STEM education, students must be presented with in-depth analysis of proven scientific concepts. There are many
793. scientific and engineering discoveries yet to be made without asking students to be skeptical of the science they need to move forward. Students applying to prestigious universities for STEM education, and all areas of education, should not be hindered by a science curriculum that omits crucial facts.
794. The breadth of content should be focused on those areas suggested by the science teachers who originally created the standards.
795. Douglas's narrow view of the world lacks any basis in fact...calling it science is a huge stretch.  
Removing explicit references to evolution and "The Big Bang Theory" is not only foolish but also unprofessional and ignorant. While these are scientific "theories" in name, they are still widely accepted as truths. The theory reference allows students to test these theories and validate them. It
796. does not mean they should not be address or should be avoided and ignored. Also, these are standards to address the needs of schools and students, not support the superintendent's personal beliefs and ideologies.  
Hiding from evolution is just really not going to cut it folks. Again, leave it to the committee and keep
797. the zealots paws off it. Again - Do not let Diane Douglas touch the content except of minor grammar edits. She is just not qualified.



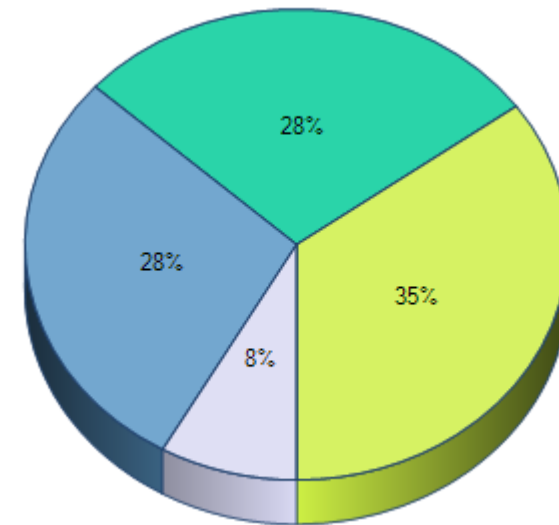
798. Keep religious philosophies, astrology, new age superstitions out of science.
799. They are based on scientific data
800. No. By omitting references to evolution you are no longer addressing the full span of scientific knowledge.
801. it doesn't include getting rid of the theory of gravity.
802. Too much variety at the middle school levels  
Creationism, intelligent design or whatever you want to call it has NO place in the science curriculum.
803. Science standards should ONLY be devised/ revised by knowledgeable SCIENTISTS, NOT MS. DOUGLAS, who is showing her ignorance on the subject! There is no place for religious beliefs in public education.
804. Interactions of matter and waves/light are not addressed in Physical science. Structure and function are not addressed in Life Science and proposed internal review changes do not address biodiversity.
805. See above.
806. It is missing important scientific concepts.
807. Putting in the key concept column makes the standards too granular which is contrary to the 3-Dimensional Teaching and Learning
808. To not teach the Big Bang and Evolution because they were not discussed in the Bible is like refusing to teach interns the intricacies of surgery or pharmacology for the same reason.
809. While I applaud fewer POs and deeper attention to the essential concepts/big ideas, I fear that much is omitted in terms of helping students understand Earth Science and how the planet functions.
810. They could be a little more detailed.
811. I object to any change in language that attempts to undermine evolution as scientific fact.
812. some standards have unrelated content strung together with the word and
813. The content is not aligned to the Framework for K-12 Science Education. Standards are isolated bits of content matter.
814. Where is global warming? This document contains reference to evolution. Why is Douglas deleting that?
815. I do not see one word about evolutionary science in the draft proposal, not even in the glossary. How can you set science standards without mention of evolution?  
Evolution MUST be covered BY NAME and CONCEPT. Watering it down for some religious belief is NOT SCIENCE and IS NOT acceptable. "Intelligent Design" is NOT science. It's a religious belief based on faith, but not scientific study, evidence. Evolution IS science. Big Bang Theory IS science, which is being understood more as time and space research goes on. Our students cannot be denied the opportunity to learn TRUE SCIENCE. They will suffer from this lack of teaching.
816. There can be no effective breadth of content in the Science Standards with the gutting of verbage and content surrounding evolutionary theory, natural selection, and the Big Bang Theory. ALL of the language as originally intended and articulated in the draft before Ms. Douglas's team got ahold of it, needs to be REINSTATED.
817. NGSS is what we are using. We don't even follow AZ standards.
818. The content covered is appropriate without including intelligent design.
819. There is no reason to posit that evolution is a theory in science education. This narrows the presentation and understanding of the subject.
820. They are progressive in nature as you move through the curriculum and build on each other as you move through grade levels.
821. Evolution needs to be taught.  
There is insufficient information regarding evolution. Diane Douglas's personal beliefs do not belong in science standards, and her proposed changes are an insult to the scholarly pursuit of science. I am adamantly opposed to changes to the standards that would eliminate references to the big bang theory and to evolution. While Ms. Douglas has a right to practice religion away from her desk and after work hours, she does not have the right to impose her religious beliefs on public school students, their parents, their teachers, or the taxpayers who fund education.
822. Evolution needs to be taught.
823. There is insufficient information regarding evolution. Diane Douglas's personal beliefs do not belong in science standards, and her proposed changes are an insult to the scholarly pursuit of science. I am adamantly opposed to changes to the standards that would eliminate references to the big bang theory and to evolution. While Ms. Douglas has a right to practice religion away from her desk and after work hours, she does not have the right to impose her religious beliefs on public school students, their parents, their teachers, or the taxpayers who fund education.

824. The 4th grade standard that deals with energy was weak before the internal review revisions and inaccurate with the revisions--"Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents." There is no such thing as a magnetic current. How embarrassing! Breadth hardly matters if the content is scientifically inaccurate! All of the content needs to be reviewed by science content experts representing all of the core ideas.
- You have overly simplified in the in the "DRAFT Released March 26, 2018 DRAFT". For example I feel the deleted wording on page 21 of the "DRAFT Released XXXX DRAFT" provides a better breadth of content.
- 825.
- This is just one example. In general I think the deleted wording in the "DRAFT Released XXXX DRAFT" is generally to be preferred.
- I object to the attempt to change "evolution" to "the theory of evolution".
826. These are Science Standards. Evolution is science.
- Creationism and "Intelligent Design" are stories for Sunday School. These stories don't belong in the AZ Science Standards.
827. Striking evolution devalued the standards. Encouraging intelligent design, a religious doctrine, has no place in the standards and is against the US Constitution.
828. Needs focus on evolution
829. The Core Ideas of Earth and Space Science are minimal and do not include all the Core Ideas in this discipline presented in the Curriculum Framework for K-12 Science Education (NRC, 2012).
830. Need to keep evolution. All concepts deleted by demented Superintendent need to be replaced.
- I cannot endorse any curriculum with religious content. Intelligent design and evolution can co exist,
831. but intelligent should be taught at home and left to parents to explain their family's belief system to their children.
- Actually, there is too much breadth. As an Engineer myself, I question whether "Earth and Space 'Science'" is really science, especially when it comes to trying to observe scientifically whether
832. "natural and human processes ... shape the Earth's surface AND ITS CLIMATE." This is a veiled reference to "Global Warming" (now "Climate Change"), whose cause and effect cannot be scientifically determined.
833. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
834. They are okay but we really need to just adopt the NGSS. They are well written and we need to get on board with the rest of the country.
- These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
835. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.
- What utter nonsense.
836. The NGSS should be adopted to replace Arizona's standards.
837. Tthey need to be expanded with the guidance of science educators, not anti-public education, anti-science activists.
838. Seems adequate. Hard to tell on paper
839. There is a variety of content described covering a significantly diverse array of topics for science education.
840. We do not need religion in our schools, it is illegal,unconstitutional!
841. No religion in our schools please! Follow the law!
842. Removal of the term "evolution" is clearly an attempt to accommodate backwards-thinking creationists.
- Providing a curriculum that is straightforward and allows for children to learn context and basis of fact is so necessary. Removing all references to the most widely-accepted and most robustly backed scientific theories of how humans came to be is dangerous. Science standards are being upheld here, not religious or literary standards. The basic school of thought should be taught. This isn't a library with banned books, it's the future of children who need education in the most productive way possible. Changing this language is not productive and narrows the breadth of what could be taught.
- 843.

844. Coherent conceptualization for differing grade-levels
845. This DRAFT should have been designed and vetted by scientists not by Diane Douglas who has no science training.  
I am vehemently opposed to any removal of evolutionary teaching in our public schools science curriculum. There is no fact-based evidence to support any other theory, and any so called "atomic biology" is merely religious belief masquerading as science. Any redaction of the teaching of evolution or making room for religious teaching has no place in our public schools.
846. When you try to undermine the language and terms defined by the scientific community for any scientific discipline, you take away the true authority of years of research and verified proofs that have given weight to those scientific standards.
847. Religious beliefs have no place in science standards. DO NOT remove references to evolution and replace facts with religious terms.
848. Evolution should NOT be removed.
849. Evolution should NOT be removed.
850. Teach evolution - remember the construction of the United States protects us from infringing others religious beliefs that are faith based and not fact based. Why do we even have to tell you this!!?!  
The draft that contains changes from "Internal Review" deletes language that reflects religious views and NOT accepted science. In the "Internal Review" draft, language referencing the Big Bang Theory and Evolution are altered or deleted.
851. All theories on the origin of life should be taught. Teach the scientific process and then teach them how the evolutionists and the creationists use that process to formulate their theories.
852. Always a struggle between breadth and depth
853. The new standards are missing the breadth of content for Evolution and Changes in the Environment.  
There is too much earth and space content for each year of high school. I prefer that each subject be separate not blended together. It is much easier for students if you need to move states or school districts.
854. Any science standard that obfuscates the significance of evolution is lacking.
855. Put it back the way it was.  
The focus of the committee was on fewer, broader standards to allow for greater depth, more connections, deeper understanding, and more applications of content. The current standards do not meet that criteria.
856. The changes show no breadth of content. This language is made up. We are raising kids that want to have careers in science and this new language that is clearly an agenda.  
I believe the breadth is more than sufficient. In fact, with just a 3 year requirement for science, there is too much. It will be hard to go to the depth required with all the breadth required in just three years.
857. Eliminate the reference to fictitious beliefs having no basis of proof.
858. For high school Earth and Space the content was sufficient. It was very similar to other previous standards.
859. As of now, the content is well specified, however the organization of the current district and state testing does not allow for sufficient teaching of the content in an appropriate manner of time.
860. the 3D wheel connected with how the standards written is a good move in the direction of breadth.  
The content has an appropriate range. I do however suggest again that certain concepts need to be broken down into smaller chunks and there are even areas that are somewhat missing or just placed into inappropriate areas. For example, HS.L2U1.25 may want to be put under a biochemistry tab rather than cells and organisms. It seems as though the cells and organisms section needs to become three separate tabs, those being biochemistry, cells, and organisms.
861. If we can get the order of the concepts from small to large AND if we do not have tests at weird times (such as AIMS test in the beginning of April) the content would be sufficient. Having so much the first semester to be taught to the students before our CRT is a little overwhelming and I know many teachers do not get through all the content for that first semester CRT exam.  
So the answer for me is I agree that is is sufficient amount of content, BUT it is organized within the school year time-frame poorly. If we can re-organize it we would be very happy.
862. It doesn't give enough overall information of what is needed from each topic. For example in the standard for Life Science 1.L2U1.8 it says under key concepts "introduction to obtaining resources

- through body systems". What does that even mean???? Does it mean body systems as in the circulatory system? Or does it mean water, air, teeth, vitamins? It's so confusing
868. The Standards seem to address most of the major content for Science.
869. The breadth of content is too broad in many areas. We should narrow the essential standards to what is TRULY essential for everyone to know coming out of high school
870. The standards leave out space and exploration.
871. The Standards are not specific on Climate Change. There is no specific Global Warming information.
872. Is this whole thing about whether or not to teach evolution? I have a problem with using the term "THEORY", when evolution has been proven. It has been proven and those who struggle with reconciling that with their private religious beliefs need to study and understand the difference. I believe that a person can believe that dinosaurs existed billions of years ago, and still believe the Bible.
873. keep evolution reject intelligent design fire this lying woman
874. Evolution as science is essential to be taught along with creationism.
875. True science
876. The content that is proposed are not appropriate for public education.
877. There is a wonderful amount of breadth, and the focus on big ideas and cross-cutting concepts is a welcome and useful addition to the scientific curriculum discussion.
878. There is a continuum of depth of knowledge and previous knowledge is used as a building block. Students are asked to build "models"; however I feel there is a lack of original inquiry and design into "practicing" science that students are encouraged to do.
879. I have concerns of sequencing concepts in the 6-8 grade band. Like in 7th grade there is not enough information or conceptual knowledge on atoms, will they already have elements and Periodic table? I fell that the concepts are very choppy, it jumps around. 6th grade just atoms, vs. 7th needs the subatomic particles. The flow needs to be a better spiral if that it what needs to be happening.
880. There are some concerns about the sequencing of concepts so that students have prerequisite skills and concepts to be successful at a specific grade-level. For example "particle models" will they understand atoms, sub-atomic particles, elements, Periodic Table, etc. I am concerned that the concepts do not flow and build upon one another. The standards are very vague and can imagine that districts will interpret differently--which becomes a huge problem when students move/transfer. The topics provide a scaffold for building the curriculum at the district levels. Scope and sequence should be looked at more closely.
881. I have a lot of concerns with how the concepts are sequenced between 6th, 7th, & 8th grade. Will the students have enough information to process what atoms are in 7th grade? When is the Periodic Table of Elements going to be introduced? Will students have the conceptual knowledge to be successful in science. Standards are choppy and have no flow to them . They do not build upon one another.
882. There are concerns about sequencing within the 6-8 grade band. There does not seem to be sufficient support at the lower grades to support concepts of atoms and particles. I do not see any mention of the periodic table at the lower grades to help support understanding of atoms and particles. However, the periodic table seems to be a fairly difficult concept for students at the lower grades.
883. They are bad, You shouldn't eliminate or water down the ideas of evolution and the big bang. They are scientific theories, which have been proven time over time. Evolution is a FACT
884. I was disappointed to see that lab safety was taken out of the standards.
885. I strongly disagree because it does not include space.
886. A
887. See above comment. I'd rather leave comments on breadth and depth of content to educators who are better versed in how the standards are implemented.
888. Pure science related education needs to be expanded and must be based on pure science.
889. Religious beliefs, not backed by science, have been added.

**9.** The Science Standards have sufficient depth of content and rigor.



	Response Total	Response Percent
Strongly Agree	121	8%
Agree	420	28%
Disagree	417	28%
Strongly Disagree	516	35%
<b>Total Respondents (skipped this question)</b>	<b>1474</b>	<b>7363</b>

**10.** Please comment about the depth of content and rigor of the Science Standards.

1. ADE additions change this in a bad way
2. The Science Standards are confusing because they are vague and lack clear objectives
3. Perfect
4. Not enough information to gauge. Standards are vague - curriculum could be made more or less rigorous based upon district or teacher.
5. Rigor is improved over current content standards.
6. The broad nature of the standards leads to a surface level of teaching. Surface level is not Depth or Rigor.
7. Too much to cover! If we are to cover all of the key and + items listed, we cannot cover in depth. We essentially lose the month of April and then May due to the timing of the state assessments.
8. the only thing I see they contain is confusion and problems  
Rocks and Minerals was taken out of third grade, which I think will make it harder for fourth grade teachers to build upon that the next year. There should be more Earth Science.
9. Also, I need to know the EXACT key terms that my kids need to know. I am not a scientist, and I don't want to do anything wrong.
10. The depth and rigor seem to be there but with out proper curriculum, this is very difficult to see.
11. The revised standards seem to specific to content. Phenomenon explanation that requires content from many science concepts should be considered.
12. Again, the elementary standards are too in-depth
13. So for third grade, we are only focusing on the Sun and how it effects life on earth?  
The standards do lend themselves to go deeper into the various core ideas however the green edits for the key concepts have done the opposite of requiring rigor and depth. These are prescriptive and while the statement might say they are not intended to be a minimum or a maximum but they ARE NOT appropriate nor should they be included for the purpose of implementation of the standards.
14. That would take us right back to the idea of POs which are truly a checklist of "things to teach". We may as well have not changed a thing if we are going back to including exactly what to teach especially indicating this would help with implementation. That is NOT the intention of standards, that should be left to the PD districts and schools determine is best for implementing standards.  
Needs to be way more specific... obviously the creators of this have not actually worked with teachers of various knowledge levels. By leaving the content open ended teachers will interpret it in too many different ways. BE specific.. Ex. Newtons First Law... Gravitational forces.
- 15.

16. The key concepts reduce depth of content of the standards written by Arizona teachers. The key concepts have no depth. Remove them.
17. Once again I'd like to see some confirmation on biological facts such as there being only 2 genders.
18. Again where's the engineering and geology - most Earth and Space Science is Space.
19. They give adequate opportunity for experiment and observation to draw conclusions.
20. I feel these standards barely scratch the surface in terms of depth and rigor. While I appreciate they are less recall knowledge and more general, they still don't lay nearly enough out in terms of what I would be teaching in each concept area to consider them rigorous.
21. They are rigorous, however, I feel some teachers may need more explanation, or some examples. We also need access to more resources.
22. Newton's Laws has been an 8th grade science standard for at least the past 10 years (at least ever since I started teaching in AZ) I'm concerned with having it taught in 7th grade and whether or not students are ready for the concept. The math in Newton's 2nd law, 8th graders struggle to grasp the concept and solve the problems.
23. This is largely based on the teachers and students prior subject knowledge. The standards allow you to go as deep as you want within the aforementioned constraints.
24. I am very impressed with the higher level thinking and real world applications our students are being asked to think about and investigate (e.g. 2nd grade: Analyze patterns in weather conditions of various regions of the world and design, test, and refine solutions to protect humans from severe weather conditions.)
25. Not enough detail needs to be broken down more
26. Very high rigor, may take a couple years to get students up to par
27. Just touching the surface - no in depth. Should divide by science fields to allow in depth studies.
28. It gives me lots of options to work
29. na
30. I think students will be challenged in a positive way with the new standards. I really like the incorporation of engineering.
31. I would argue that these standards are too in depth for the amount of focus given to Science in schools.
32. Some of this content was previously taught in high school and is now middle school standards. And a harder concept of physics was moved from 8th to 7th and an easier concept of the layers of the earth moved from 7th to 8th.
33. I believe the rigor is not sufficient because not enough background information is going to be used for teaching content.
34. It seems as if the standards are moving away from discovery and experimental learning and more towards writing and academic theory.
35. The "key concepts" section should be removed as it is antithetical to depth of content.
36. The actual standards are written to an appropriate depth of content and rigor. However the key concepts narrow that down to memorizing vocabulary. As the entire document is written, the depth is sadly lacking. This can be fixed by removing all of the ADE additions.
37. Evolution description and related areas have been watered down in the proposed standards, relative to recommendations of the Association for Science Education.
38. The standards for biology are not comprehensive enough. Speciation is left out of evolution; a vitally important concept. Evolution is downplayed and appears as an afterthought. It is a centralizing and unifying theme in biology and acts as a framework for a large portion of biological research. It should be emphasized as such.
39. First, the word "believe" has no place in the standard. Scientific concepts about evolution are based upon evidence, not belief. Second, there is no mention of a universal common ancestor as included in the Association for Science Education's Working with Big Ideas of Science Education.
40. May go too deep and specific
41. The "key concepts" column in the HS Earth and Space science standards reads like a vocabulary word list. It is the lowest level of depth on Bloom's taxonomy while also managing to be scientifically



inaccurate in some cases. Examples; ultraviolet light doesn't measurably alter weather, no one says "the four spheres" and that leaves out the cryosphere.

42. There are too few standards and ideas to go in depth for each branch of science.
43. Provide more examples and vocabulary.
44. Please do not water down the evolution standards. By doing so, you decrease scientific literacy. There are 30 plus scientific organizations which have felt strongly enough about this topic to make public statements about it. I will be happy to provide you with references if requested.
45. Comments on evolution have been deliberately weakened!
46. There is not enough coverage into technology at an early grade level - something that needs to be addressed.
47. The standards are vague and some of the more rigorous standards have been moved to lower grade levels.
48. Like how the left column develops understanding
49. Depth should be all in one grade in middle school
50. To vague and worse than what we had before. Atleast before, we had steps and suggestions to help us understand what smaller areas of study/concepts building
51. The depth and rigor is not specified. (I'm not sure it should be or how that would be done. The depth and rigor is ultimately about the teaching practices and the difficulty of the assessments.)
52. The rigor of the content (especially at the lower grades K/1) may be cognitively above students' ability (ie genetics) Too much content to cover so deep.
53. These represent broad topics... I certainly would not use the word "depth" to describe them.
54. More simplified, but allows us to teach rigor at a more developmentally appropriate pace.
55. These standards seem far more rigorous than the previous set. It's nice to have some direction on what kinds of questions to ask and what level of inquiry to attach to each standard.  
Has the assessment for the science standards been addressed? The content and rigor is is completely dependent upon how the students will be assessed. If the students will be assesed on true application of the "standards" and the core ideas in knowing and using science then the draft of the standards is perfect (as long as the "key concepts" column is REMOVED). However if the students will be asked recall/vocab lower level questions then there are concerns for how we will maintain consistency from one classroom to another across schools, districts , states etc.
56. Much deeper than previous standards. Maybe provide some questioning to accompany each standard as a guide for going deeper
57. The standards are very general and do not emphasize key concepts to be learned. The new standards lack the depth needed to bring students science knowledge to the high leveled rigor that is needed to be successful in their future.
58. We believe that the standards need to include the verbiage with prompting and support because in all other standards for kindergarten it contains that. They are still learning to ask and answer questions with the help of the teachers.
59. The content is not in depth and will leave districts to interpret what will be taught. This will lead to inconsistent content being taught. Specific learning objections need to be included for each standard so that the standards are taught with consistency around the state.
60. Only looking at the work the committee did. All ADE changes that the committee did not approve should be removed.
61. No time to get into depth of each content
62. It's hard to tell with how they are written.
63. It is difficult to include rigor within the content without having more specific guidelines about what should be covered. Using the overarching core ideas for knowing is a great way to show where students should be at the end of high school, but it is difficult to see how the ideas in an elementary grade level will apply to this idea. Leaving just the standard makes it difficult for articulation and being able to rely on what a previous grade level will have taught.
64. The depth of content builds on previous taught standards and is progressive but the rigor appears to be quite advanced for sixth graders on a cognitive level. Additional standards added are more suited for older students.
- 65.

66. It gives us a chance to go more in depth over a longer period of time.
67. Not obvious of the depth of content. Teachers without a science background will struggle with the broad standards.
68. Drilling into each subject area is important. A cliff-notes level of coverage doesn't serve anyone's purpose but most of all the students who will not see the point and/or will not engage because their is not time to develop interest.
69. Depth is open-ended, which is good. Allows for teacher choice of methods.
- Add additional Physical Science Plus (+) Standards for Chemistry:  
Develop models to explain physical and chemical properties and changes in matter based on energy of the chemical system.  
Comment: In Chemistry section of Physical Science Essential Standards  
HS.P1U1.4 Plan and carry out investigations to explore the cause and effect relationship between reaction rate factors.  
This standard as written does not make sense. The problem is using the words "reaction rate factors" here. It should be written as:
70. Plan and carry out investigations exploring how the change of temperature or concentration of particles influences the collision rate between particles.  
The HS+ Standards under the above "Umbrella" Essential Standards should include:  
HS+C: Plan and carry out investigations to gather evidence of the relationship between chemical and physical properties of compounds and the solubility of substances.  
HS+C: Plan and carry out investigations to gather evidence of the relationships between kinetic molecular theory and gas laws.  
I agree with the depth, but am concerned about the 3 years of science requirement not being enough.
71. To get the whole range of [good] concepts, students would need to take a Chem and Physics courses [4 semesters total].
- This puts a burden on the other 2 semesters to fit all the other science concepts.
72. These seem challenging for third graders and inline with 4th grade.
73. In many cases the way the standards, especially the key concepts column, are changed with the internal review the changes cause the standard to be at the incorrect developmental level.  
The draft standards for high school life science don't incorporate the science and engineering practice of planning and carrying out investigations. This is a very large oversight and needs to be fixed. Students should have the opportunity to plan their own experiments and be allowed to investigate their own questions about the concepts. The essential standards side of the draft standards don't incorporate all of the essential learning progressions that each child should learn before they leave high school. For example, the cells and organisms standard of HS+B.L1U2.13 , Construct an explanation for how cellular division (mitosis) is the process by which organisms grow and maintain complex, interconnected systems is placed within the HS+ column but really should be something that all students should know. All students should know that mitosis is the process used for growth and repair not just that there is a process. The standard that is listed within the essential standards HS.L3U2.26 is really about DNA replication not mitosis. The following standards have students explore ethical, social, economic and/or political implications. HS.L1U4.27 , HS+B.L1U3.14, HS.L3U4.30, and HS+B.L3U1.18. The standard asking students to look at implications of current genetic technology is good but the key concept listed specifically references genetically modified foods and not just genetically modified organsims. When the word food is used, it is too narrow. The standard HS.L1U4.27 could be eliminated and the standard HS+B.L1U3.14 could be for both but changed to say Obtain, evaluate, and communicate information related to new technologies for cell research.
74. It seems too rigorous for Kindergarten. For example, "Obtain, evaluate, and communicate how the human body has different systems that carry out life processes." Another example, "Design and evaluate a tool that helps people extend their senses" These seem quite high level for Kindergarten students.
75. They seem more in depth.
76. These are not what the committee created
77. Once you take into account the number of non-teaching days due to standardized testing, in classroom assessments and review/reteach requirements, and time to run experiments with theory lessons, the amount of information to be taught in a year is far more than the time required to teach them. The result will continue to be students passing the class without understanding the depth of the standard required to comprehend the subject matter.
- 78.

79. different forma of student engagement is well done.
- Not manyof the life science standards truly relate to the storyline for the 3rd grade standards.
80. Standard 3.L1U1.5 doesn't relate to the students understanding how the sun provides energy to life on Earth
81. The depth of content is well spread out and designed.
- Throughout the document, the science and engineering practices are explained as being "formerly known as the scientific method," which is misleading. While the part of the old standards that most closely resembles the practices was the scientific method, they are not the same thing. The "scientific method" is a linear procedure devised by well-meaning teachers and does not resemble in any real way what scientists actually do. The "Science and Engineering Practices" are intended to be a comprehensive, non-linear outline of all of the roles and tasks a scientist must do. Without explanation of this key difference, there is a danger of teachers continuing to teach the "scientific method," which is contrary to the intent of the standards.
82. The wording of the explanation of Core Idea L4 on page 78 is confusing and inaccurate. First, the phrase "are believed to" is used, which represents a fundamental misunderstanding of the nature of scientific theory. Science does not deal in "beliefs," but rather analysis and interpretation of empirical evidence. In fact, this is the only instance in the whole document of the use of the word "believe." Secondly, while the explanation would read better if the words "are believed to" were deleted, "Over countless generations changes resulting from natural diversity within a species lead to the selection of those individuals best suited to survive under certain conditions" is still inaccurate. The generations are not "countless," which is a meaningless word. One can, in fact, count generations. Also, the changes do not "result from natural diversity," they are caused by random mutation, which in turn contributes to the cause of genetic diversity within a species.
83. The AZ Dept of Ed changed some of the big ideas for science standards in a process that was not transparent with no documentation.
- I like the option of teacher's choosing which higher level concepts they wish to too cover with the essential and plus standard setup. Just as long as the AzMerit exam only asks questions from the essential standards. But I do think some Plus standards should be made essential. As students would not likely be ready to move to a college course.
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85. With containing all sciences one can greatly differentiated instruston and labs
- As an educator I am very worried that some teachers will look at these topics and barely scratch the surface of what needs to be covered. I know that the goal was to get away from POs, but without some guidance, teachers will cover this material with no depth.
- Some of the items listed in the key concepts column are incorrect. There are some simple typos (plants in orbit, instead of planets in orbit). And other places where the connections trying to be made are very far reaching (fractals in relation to predicting natural hazards).
86. It looks some some material that was taught previously has been taken out. There is no specific mention of the rock cycle or minerals in grades 6-8. It could be eluded to in standard 7.E1U2.4, but I would not count on all teacher interpreting it that way.
- I feel that many standards are left open to interpretation.
87. There are places that the depth seems disjointed or does not scaffold well. 6.E1U1.6 would be better suited in 7th grade with the hydrosphere and not as an extension of 4th grade standards.
88. There is certainly a depth of content which allows teachers to see exactly what pieces of content they need to be including in their lessons.
89. It depends on who is reading it. Right now, no
90. I think I've already commented on that.
- I do see that there is an attempt of adding more rigor and depth of content in teaching Science. But I repeat standards are broad, teachers have no specific curriculum. Are we supposed to depend on internet for resources. Maybe giving us some reliable resources would be helpful. We all know that information on the internet is not 100% correct.
91. See comment for number 11 as it relates to the depth of content specified; however, I believe the rigor to be sufficient. First grade is very rigorous.
92. See comment for number 11 as it relates to the depth of content specified; however, I believe the rigor to be sufficient. First grade is very rigorous.
93. See above

94. At the higher levels, most of it seems fine. However, at the lower levels like kindergarten, they should not be evaluating. This is something that I teach at the high school and they struggle with the evaluation process there. Also, in life science learning objective 4, it uses the word seek to make clear and that is not testable and is very subjective. This needs to be put in measurable terms that we can see.  
Higher level depth seems appropriate, however the lower-level standards seem too deep in areas and not deep enough in others. To have kindergarten "obtain, evaluate, and communicate" may be a little challenging...too challenging.
95. Also, in the high school life-science section, the change stating "evolution seeks to make clear" could not be written more unscientific. A theory cannot "seek to make clear", instead, a theory can provide the best possible explanation based on the set of data it supports.  
Other scientific inaccuracies like "force-fields" and "magnetic currents" need to be re-evaluated.
96. Some of the rigor is too much in places, in other places it is lacking. For example, linking equilibrium and redox to the topic chemical reactions.
97. The depth can be adjusted by the instructor as needed but the scaffolding provided gives enough information to the instructor so they can teach it appropriately.
98. Not enough.
99. The Key Concepts added by ADE limit the depth of content and rigor.  
Life Science 5.L3U1.6: The depth is too vague. It should indicate how deep to go. For example, if we need to introduce DNA at the 5th grade level, it should indicate so. A further concern...The key concepts column for this same standard lists "reproduction", and the Standards column says "including humans". This seems to indicate that 5th grade should "touch" upon human reproduction. None of our 5th grade teachers (at our school) thought this appropriate. We don't believe that is the intention of the standards, and yet, it is ambiguous. It could be interpreted as such.
100. I do like the use of DOK levels and getting students to think critically
101. should increase the amount of depth of content that is expected to teach
102. Pretty specific about what the standard is asking of the students of what they are able to do by the end of the standards.
103. Even though they are hard to read and confusing at times, they seem to have some continuity.
104. Not sure since some are surprisingly vague.
105. I find that the rigor of the middle school standards could be increased.
106. Needs more depth of content information and rigor is fine.
107. The influx of Physics should significantly increase rigor.
108. Refer to question 11.
109. The concepts of physics and Newton's laws may be above the math skills grade seven students have. Not all grade seven students have mastered basic algebra/geometry...
110. If this is meant to be integrated into our ELA instruction, our focus would not be a rigorous science lesson, but a rigorous ELA lesson.  
The standards for science is limited and similar to what we already teach. However, 40 minutes a day is not realistic in today's classroom, where we teach math for 90 minutes, ELA for 60-90 minutes, Computer Science for 30-60 minutes a day as well. This does not include classes like PE, Music, and Art. If we were to teach to the level of rigor that this deserves, we cannot integrate it into our ELA instruction.
111. We may have depth and rigor in place but if previous grade levels don't do their part then it doesn't matter what you have in place one teacher can't teach them everything in depth.
112. There is enough depth of content and rigor.  
I am very concerned about the addition of the key concepts column. My understanding is this column was added but not approved by the teachers and other experts who wrote the original draft. I don't believe that it is a good idea to force teachers (in effect) to teach certain topics as given in the key column. It should be left as it was prior to the internal review.
113. Content focus is very narrow with little room for exploration of related concepts.
114. Content focus is very narrow with little room for exploration of related concepts.

117. It is difficult to have a depth of content and rigor when you switch around to so many different concepts.  
The science standards committee sought to connect core ideas, crosscutting concepts, and engineering practices to make sense of the natural world and understand how science and engineering are practiced and experienced, known as 3-dimensional teaching and learning.
118. The sixth grade science curriculum should cover the life science topics, seventh grade should cover earth science, and 8th grade should cover the more difficult topics such as physics, chemistry, and genetics. Physics should not be covered in 7th grade, but weather does make sense. 8th grade should not cover geological time scales if 7th grade is covering geology. In sixth grade, modeling from atoms up to the ecosystem level is sufficient. Scaling up to the universe doesn't add anything if modeling to scale.
119. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
120. appropriate depth and rigor  
By joining the group of states leading the effort to develop new standards that are internationally-benchmarked, more challenging, and require students to apply their science knowledge and understand how science concepts fit together, Arizona will improve the quality of our student's STEM education.
121. Science content needs to be more rigorous in general. These standards are very basic and have little to build on.  
Too rigorous - how many teachers do you think will really grasp the proposed topics and level of detail? Most teachers majored in Education, with science as a minor. The details which you propose would be for a major in those topics. Most teachers would be lost without a teacher's manual to attempt to educate themselves. How many students as a percentage would grasp this, when a lot of them can't even read when they graduate? Most kids do not live in your bubble.
122. Has a good of flow of the content
123. The rigor is well written but our curriculum does not meet the needs of these standards.
124. These would be at a DOK3 or 4 level and we are just introducing these concepts to them this year.
125. It doesn't look like there is a clear direction of information for What the teachers should actually be teaching.. its broad
126. I feel like its laid out and a good overview
127. For 5th grade there is too much for them to know. They have a lot on their plate already and there is A LOT of content that they are now required to learn.
128. Seems like a lot for students to have to take in.
129. The rigor in all of the grade levels is way too high. There are concepts listed that te young students do not need to be learning. They are not age appropriate.
130. The content boundaries are a great way of having a consistent classroom instruction throughout the school district.  
This draft is still to broad. We need to know exactly what to teach. I am not a professional science teacher so I would just like to be told exactly what to teach. I don't want to spend countless hours on-line googling what to teach for each standard.
131. It is difficult for me to see the depth of content and rigor when I cannot easily disseminate exactly what the standard itself is and how that would translate into a lesson.
132. Some of the concepts seem too rigorous, and far above a 6th grade level.
133. The content and rigor build upon one another.
134. content and rigor build on each previous grade level.
135. I feel the standards do have rigor and scaffold nicely.
136. Once again how deep can one go with the few standards in the Earth Sciences. And how can you get the rigor necessary with so few standards.  
I don't see how these standards actually provide depth and rigor. That is what the materials created to teach the standards are hopefully going to provide. If they leave in the key concepts, I feel the teachers will see those as performance objectives and teach to those...and they certainly are not deep enough or rigorous enough.
137. I don't see how these standards actually provide depth and rigor. That is what the materials created to teach the standards are hopefully going to provide. If they leave in the key concepts, I feel the teachers will see those as performance objectives and teach to those...and they certainly are not deep enough or rigorous enough.



142. By adding a "key concept" column, you may be inadvertently preventing teachers from getting into the deeper levels of understanding which are required for effective science teaching and learning. Some may view the key concepts simply as terminology for students to simply remember as opposed to learn and experience from a deeper perspective.
- The actual standards allow for appropriate depth of content and rigor. However, the addition of key concepts has severely limited the depth to a vocabulary list. Additionally, many of the vocabulary
143. terms that ADE staff added outside of the working groups are not at the appropriate grade level. ADE's additions have severely broken the articulation and learning progressions that are clearly outlined by the research documents cited in the standards.
- There is no rigor involved in suggesting the theory of evolution explains anything. It attempts to REFUTE the clarity of genetic information and how it is preserved in offspring. Classification systems are man-made, and for our convenience. They are not evidence of actual relationships between species or genera. Evolution isn't a theory. It is a historic model and a religious belief. As such, it should be evaluated on the basis of the EVIDENCE, and all evidence that shows how inaccurate its interpretations are should be presented, and students encouraged to use the scientific method to
144. evaluate the evidence. The theory of evolution should never be taught as fact. The facts are the material evidence. Evolution is an interpretation of the facts. I am grateful beyond measure that evolution was not taught in my biology class at Rincon, but I found the many movies we were shown that mentioned it to be downright irksome. I never found any merit in the theory of evolution. It never even made logical sense. I don't want my dozen grandchildren who live in Arizona to be taught that evolution is fact. It infringes the family's right to freedom of religion without indoctrination in the schools.
145. The standards seem to promote actual science learning instead of social stories about science.
- I agree there is a better depth on content based on what standards were chosen however I was under
146. the assumption there was going to be more focus on engineering and computer science so I'm somewhat disappointed.
- The Board of Education's Internal Review of the Standards changed the standards by adding the "Key Concepts" to the original standards created by the committee of professionals before Diane Douglas took them for internal review. This significantly changes the content and rigor. The key concepts goes
147. back to the 2004 standards and does not use the research of the best way to teach science established in the "Working with the Big Ideas of Science" and the "Framework for K-12 Science." This will result in just hitting the key concepts and not really following the 3-Dimensional Learning that leads to deeper thinking and understanding. This 3-D learning involves the Practices of Science and Engineering, use of Crosscutting Concepts, and Disciplinary Core Ideas.
- The depth of content and rigor vary throughout the document. Most of the standards have key
148. concepts but not all of them do. The standards without key concepts are vague and are open to large amounts of interpretation. When key concepts are listed the standard becomes a lower depth of knowledge level and key concepts begin to act as check list.
- I believe the depth of content and rigor could be well done if some of the wording had not been changed from the original document submitted by the committee. There are some words that were changed that cause a standard to no longer be age appropriate based on research.
- For example K.P2U2.1 - Investigate how the five senses and their associated body parts can detect
149. light...vs Investigate the senses used to detect light
- The way I read the current standard would require having students in kindergarten investigate how the eye detects light. This is not developmentally appropriate. The how would require the student to have an in depth understanding of how each of these body parts work.
- I am only referring those science standards that were developed by the committee not the additional words/comments/ideas.
150. Changes made in green often change the developmental level of a standard and often these changes are inappropriate.
151. Hard to really focus on a content when we jump from biology, weather, genetics.....I like current standards and how 8th grade science is mostly physical science.
152. Again with a broad statement how do we know the level of rigor required.
153. Evolution section is weak and watered down. It needs to be strengthened.
154. erroneous - ex 4th grade energy
155. I am wondering if we will be given a curriculum to use so that I can teach these new standards?



156. It is hard to say without trying to teach them first.
157. Rigor may depend on specificity, so that may be somewhat missing.
158. In physics the organization of content was excellent.  
Cross cutting concepts should not be limited to specific grade levels. Each of them can be applied at all grade levels depending on the content. They can also be used in other content areas.
159. The key concepts are all vocabulary words and do not provide information about actually understanding of the concepts.
160. Yes teachers can adjust the depth and rigor to the level of their students.
161. I'm concerned that the 'key concepts' will compel teachers to cover a predefined checklist of terms without placing emphasis on the connections between concepts.
162. I am not happy with the changes made by Superintendent Douglas.  
Many of the edits shown in the red-line version show that this latest version seriously diminishes the rigor of the science standards. The removal and/or minimization of reference to evolution and natural selection and also man's involvement in climate change goes against current scientific knowledge and if taught at that level will put our students at a severe disadvantage compared to better-educated students elsewhere.
163. What about species evolution and the Big Bang theory? Why are we excluding the science behind the origin of our world and how humans came to exist?
164. The deletion of evolution and Big Bang theory need to be included in these standards
165. Separate church and state when it comes to Science standards and get the students career and college ready.  
On page 62, I take issue with the crossing out of "supporting evidence for the Big Bang Theory and the scale of the universe" and the addition of the word "critique." The Big Bang Thoery is an established, supported, and dominant thoery and it's impotance should not be minimized.
166. Taking out Evolution and the Big Bang theory just makes NO sense whatsoever. Again, let actual scientists and science teachers write the standards, not bureaucrats who know nothing about science and don't believe in established scientific theories and FACT.
167. Devaluing the Big Bang Theory and the concept of evolution prohibits educators from providing in depth content and solid education to their students.
168. Taking out evolution? Are you daft? This serves nothing except to put our children behind and remove stem. Insane!!
169. Evolution and Big Bang theory are not represented properly and the age of the earth is falsely stated.  
It is important that AZ students be knowledgeable about fundamental science if they are to be ready for college & careers. That includes teaching about the theory of evolution and the big bang.
170. Eliminating these fundamental concepts from our states science standards is an embarrassing and regressive move that will set our students back.
171. I like the integration of the k12 framework rigor within the standards.
172. Evolution and Big Bang need to be taught.
173. They do not explore evolution and big bang theory....a scientific reality  
Evolution, the Big Bang, the age of the Earth, and other basic concepts of science must be represented accurately in these standards. Religious ideas like the 6,000 Earth as NOT acceptable in a science classroom.
174. It's Unconscionable to remove scientific knowledge of evolution and to remove teaching the THEORY of true Big Bang. I
175. Why on earth have you removed references to evolution and the big bang theory???
176. See above.
177. I would argue the rigor in lower grades is too much. Many of the physical science standards are not age appropriate for K.
178. I don't know and understand what rigor have to do with this..
179. They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.
180. The National science education standard are better.
- 181.
- 182.
- 183.

184. By removing phrases such as evolution and Big Bang theory, we are not preparing our children for the rigors of science they will experience in college.
185. The rigor is a great improvement over the current standards.
186. There seems to be a lack of information on evolution, the foundation of the life sciences.
187. It seems that there is a "theme" to leave out the ideas of evolution and adaptation, even from the earliest levels, and that it is still theory and that students can construct viable arguments against the facts of adaptation to environment and the concept of evolving and change over time..... this is troubling
188. You can't omit the most prevalent theories of life an existence in favor of personal belief.
189. Analysis always requires more depth. At the high school level, this should be required most of the time.
190. No comments
191. Nope.. the shallow depth and weakened rigor is in those "chosen" topics. All other topics are forgotten.
192. There is no mention of the scientifically accepted concepts of evolution or natural selection. These are core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.
193. I feel that the new standards do not cover evolution sufficiently, and the removal of terms like Big Bang do not do any justice to true science. NGSS standards more accurately cover real science concepts and how we should be teaching science.
194. I feel like the Next Generation Science Standards are better and fleshed out with "real" science as opposed to "eduspeak". As far as rigor concerned that Newton's Laws have been moved to 7th grade because mathematically the majority of kids are not ready for formulas until 8th grade. Wonder why is was moved to 7th? The term "rigor" is objectionable to me. Again, some invention of an education major. Until this state gets serious about actually counting the Science test as viable data I cannot see that it is serious about rigor.
195. As the standards are written there is not enough direction on how deep you ought to teach too.
196. I teach 6th grade physics at a STEM-focused charter school. Our curriculum covers far more topics than this draft, but even we do not address Newton's Universal Law of Gravitation until 7th grade. In my experience the students benefit from detailed investigation of the behavior of gravity on Earth, moon, planets... before diving into Universal gravitation. They get the most out of learning these relationships when they have the mathematics to understand the models.
197. similar to what we already do.
198. See above. Not only does the breadth not cover the information that needs to be taught, the depth is superficial, elementary and simplistic. Our students strive for more rigor, more relevance, and realistic applications. They are capable of more -there is a severe lack in depth in content and rigor. As for Earth and Space Sciences, most of the "plus" content is imperative to teach the basics anyway-- students need to understand the processes, they why, the evidence behind the big concepts you are suggesting --without the basic evidence, they will not learn to reason and provide their own problem solving experiences.
199. The standards don't go deep enough into the origin and evolution of the universe by ignoring the Big Bang Theory. They also don't go deep enough into Life Science by not directly addressing the theory of evolution.
200. In grade 4, the concepts of understanding behaviors that enhance health and behaviors that harm health are vague. What do they mean? Will students be learning about a balanced diet, exercise, sleep, addictive behaviors (tobacco, alcohol, drugs)? Without specifics, how does a teacher know what they are expected to teach?
201. Evolution needs to be taught and called what it is. I'm sure you are well aware of the scientific research documenting it, and it is time to stop sugar-coating things for people who cannot accept science and who do not understand the differences between a theory in scientific terms and a theory in layman's terms.
202. Many of the plus/extended items especially in earth sciences should be taught to all students. There are ways to make this accessible. Look to college earth science courses for guidance. Connections between elements Ocean-Atmosphere-Earth plus space should be considered but only once students have a higher level (beyond middle school) understanding of each of the elements -- build the science and apply it. Bring a group of earth scientists together to revise these standards. Climate modeling

before students understand the physical mechanisms of what climate is and what feedbacks are involved? Will students have the math and physics to understand models in any depth in high school? Climate models are not the end all but a simulation of our current understandings within current limitations, and subject to change based on observation and new mathematical techniques. Students need to understand how models are built and their limitations --- models are evolving "living" algorithms not the absolute, that's what makes the field exciting. Please keep the politics out, teach the students the fundamentals and let them make their own scientifically based opinions of critical issues. To teach earth science with rigor, schools will need to develop or seek true earth science teachers, not just teachers who have a vague idea of what it could look like. Earth science is no longer the non-scientist escape course, see what happened in our neighboring state with colleges and accepting high school credit for the class. As I come from the earth science world to high school, I'm concerned about the vertical flow of earth science from middle school through high school expectations -- high school seems like it is somewhat incoherent and vague in structure, and not well connected to what has been taught before.

203. With the addition of all the specifics, and vocabulary, it limits the amount of depth in a topic that a teacher will be able to reach. We need to focus on problem solving skills as most future jobs aren't even a job yet. By tying a teacher's hands and requiring many different ideas within a topic, I feel like this is just a prettier version of what we already have. This does not push 21st century skills.
204. Some standards such as evolution, the use of fossil fuels, and evidence of the age of the universe are too watered down based on what the scientific consensus is.
205. The levels of each standard include a higher level rigor, which is helpful for teachers. I agree that this is needed, however, I am concerned that teachers who are not able to reach this rigor (due to student learning levels and knowledge levels) will be penalized for not meeting or exceeding the rigor identified in the standard.
206. The theoretical basis of science is selectively being questioned in this draft. The Big Bang Theory and the Theory of Evolution are being singled out as questionable or lacking consensus among scientific experts. Adoption of wording and recommendations based on personal opinion or beliefs rather than data-driven consensus would undermine the very foundation of scientific education and practice. Suggesting to students that one can selectively choose to find certain data credible or not based on belief is absolutely contrary to the principles of scientific discovery and will compromise the understanding of science and perhaps later the development of a scientifically-able work force.
207. treating evolution as a "theory" is bogus. Is the state proposing to replace rigorous science education with superstitious creationist nonsense?!
208. I spotted a number of incorrect terms used so I object to sufficient rigor. Particularly a number of proposed changes degrade the quality of the standard. I can see e.g. reference to magnetic currents which is technically incorrect, also it seems like a concerted effort was made to scrub the standards of the term evolution. Matter and energy was replaced by stability and change, this is a terrible substitution and simply not the same correct message, but some type of layman's view - it is important that our science standards use scientific terms used by the scientific community.
209. Unhappy in particular with evolution info.
210. See above. Any content being removed or weakened when discussing evolution is unacceptable.
211. Some concepts are well covered, while others not so much. Teaching just enough for the students to score well on proficiency tests in comparison to others should not be the focus. The imparting of knowledge should be the driving force or focus.
212. The key concepts make some grade levels and topics too difficult for some grade levels and choppy for the flow of concepts. For example, according to the key concepts, the periodic table to introduced in 5th grade and then not taught again until high school. Also, since the breadth is so massive in each grade level there is not a way to teach with great depth and great understanding. We are just going to be teaching a lot of vocabulary with no conceptual understanding.
213. There is no way to get a depth of content with the science standards the way they are. Too much material is expected to be covered at each grade level.
214. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
215. The depth and rigor is adequate.
216. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
217. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting

future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.

218. I think the rigor is quite high, especially considering that you are expecting students to conduct investigations as part of the language of the standards.
219. More emphasis on experimentation as a tool for learning. As written, the standards can be memorized out of a book.
220. The "key concepts" waters down the aim of the written standard to vocabulary and shallow conceptual understanding. Students need deep and meaningful experience practicing science with a few big ideas, not a list of vocabulary words that will go in one ear and out the other after the worksheet or test is finished. Without knowledge of how science works, students (future citizens) will not be versed in critical thought. They will be easily manipulated and unaware of how to evaluate information and misinformation. This is so important to our democracy.
221. The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.
222. How can we call the standards rigorous when we remove the name of a key concept?
223. The standards submitted originally have good depth of content and rigor. With the edits to include language that makes the importance of evolution (a concept which is the foundation of modern biology) less clear, the standards are not rigorous enough.
224. I teach AP Biology and if you take out evolution from the standards - you've taken out one fourth of the content for the AP Biology Exam. In addition, the big bang is also one of my standards. Why the anti-science take on science standards? Evolution and the big bang are very real theories and that is our job to educate.
225. See answer to #11.
226. It's fine.
227. Keep evolution in our schools, we are doing a disservice to our children and they will be left behind in the scientific community by removing these basic ideas.
228. Randomly Deleting core scientific information about how the planet formed based on the well documented doppler effect (Big Bang Theory) and universally accepted science of DNA and evolution is completely unacceptable!
229. In reading through the updated descriptions of some of the standards, I feel as though they are being simplified (dumbed-down), when we should be going in the opposite direction.
230. AZ students should be digging deep into current methodology in science. Stop censoring their education.
231. DNA and biology show many forms of evolution (see: flu vaccine)
- There has been an omission of any reference to evolution or it's related processes, particularly reference to Big Bang theory. Please make changes to the draft to include standards that teach evolution as follows:
- HS.E2U2.17  
Analyze, interpret, and critique supporting evidence for the Big Bang theory and the scale of the Universe theories related to the scale and expansion of the universe. (DO NOT REMOVE the phrase 'supporting evidence for the Big Bang theory and the scale of the Universe')
- HS.L4U2.31
232. Obtain, evaluate, and communicate evidence that describes how inherited traits in a population can lead to evolution biological diversity. (INCLUDE word 'evolution')
- HS+B.L4U1.19  
Construct an explanation based on evidence that the process of evolution may result from natural selection. (OMIT word 'may')
- HS+B.L4U2.2  
Gather, evaluate, and communicate multiple lines of empirical evidence to explain the mechanisms of biological evolution change in genetic composition of a population over successive generations. (RETAIN phrase 'mechanisms of biological evolution')
233. These standards seem basic and lack proper depth and accuracy

234. As stated above focused on superficial learning and memorization-esque indicators versus creating and modeling testable theories; exploration. This will leave the "suggested" engineering standards largely unavailable as time will be devoted to the items mentioned above.
235. N/A
236. I feel the depth and rigor is not sufficient for global competitiveness.
237. I wonder if the expectation is too rigorous, how many will simply "not get it"
238. The AZ version is much more comprehensive than the national - I don't see where anything substantial was removed, while I do see that almost every topic was clarified with additional detail. I don't understand comments in social media forums that indicate the national materials won't be accessible to AZ - we may, however, need supplemental materials.
239. The physics standards are far too vague to know what should be taught or what the limits of the content areas should be. Mostly, the standards included a list of vocabulary words and concepts without any sense of whether the subject should be touched upon or gone into in depth.
240. Teach evolution and medically-accurate, age-appropriate sexual health education. Leave theology and religious doctrine out of science classrooms.
241. Downplaying the FACTS of EVOLUTION is not "science." It is not your job to advance the religious nonsense pushed by the AZ Republican Party. Your job is to make certain FACTS and SCIENCE are taught throughout AZ's PUBLIC schools. Parents who are made sad by science & facts may place their children in PRIVATE, religious schools.
242. Changes made to the standards have decreased the level of rigor.
243. More curriculum that help students understand how scientific knowledge and concepts directly affect their daily lives would be insightful (e.g. how microbes in the human body are crucial to our survival, how physics allows planes to fly or their smartphone to charge, or how chemistry works to treat the water we drink).
244. The only issue I have with this is having the right curriculum to meet the level of rigor. At first glance of the standard, I honestly don't know how I would go about teaching it. For example, this standard: Evaluate how energy affects wave characteristics and interactions using mathematical models.wavelength, amplitude, speed, frequency
245. The key concepts need to be more specific. Currently I have no curriculum to teach these concepts. I would like for it to be as hands-on and inquiry-based as possible. How do I go about this?
246. The fact that it is a science standard and barely touches evolution is absurd. Who ever wrote this doesn't seem to understand physics (magnets) or science (evolution).
247. The depth in the essentials is much better than previous standards for life science, but it seems weird that many of the concepts that would normally be taught in a physics course (such as Newton's Laws, vectors, etc.) are included in the essential when not all districts have an Introduction to Physical Science class in their high school curriculum, but have Biology and Earth Science as the core life and physical science courses. If the standards are to include those, then there needs to be a state mandated Intro to Physical Science class for those students who do not qualify mathematically for a Physics course, particularly those on an IEP.
248. They have diluted the evolution content, especially by not using the term, and are crippling our students' understanding of a core biological process that informs all life and natural sciences.
249. There should be more rigor
250. I see some of the most basic concepts in science, including evolution, and the big bang theory have been crossed out. Parochial religious views should not dictate science standards. Our state and country will not be able to compete in the future, by teaching watered down science standards. Put them back.
251. In particular, the statements about evolution have been softened to the point where they are scientifically inaccurate. This language should be restored to the original text.
252. Keep Diane Douglas out of this process!
253. It is impossible to have rigor and adequately prepare students for higher education and the workforce without fully acknowledging science and the accepted and established role of evolution. How can we compete in the global economy when beliefs are substituted for academic knowledge. You do not need to hide, protect or sneak in the truth. Critical thinking and the standard of science will enable students to discern the truth.
254. In general the standards are sketchy with minimal detail. In numerous cases topics are listed with no indication of what should be covered.



254. How can you have depth of knowledge and rigor when you skim a concept??
- Again, I would hope the classroom teacher would dig deeper into the concepts than what is here. The
255. standards should be the minimum taught -- and the new standards do have enough depth and rigor for that.
256. Students need to be held to high standards, these are very basic and broad. There also should be more room for content overlap.
- "Knowing science" does not account for understanding. You can know a scientific fact, but it;s meaningless if you do not understand the fact, or can't explain the fact. Please to not use the term
257. "know", as it's very low on the skill level (Bloom's taxonomy). We should seek for robust and rigorous scientific understanding in this state - this is how we grow a strong workforce. Be forward thinking!
258. see above
- No there is no true depth of content or rigor mentioned, as stated in #11. Excel to Proficient
259. minimum are needed for what students can do at end of study. That is the only way teachers are going to be able to create appropriate level lessons, assessments and plan effectively.
260. Complete teaching of evolution is being removed from teaching requirements.
- As with any cherry picking of facts to teach, someone is always going to feel that some things are too deep and others not deep enough. I worry that many of the things that we have struggled to get 8th
261. grade minds to adequately conceptualize are being pushed down to lower levels. As a teacher and a parent, I am seeing this across the board in all contents in the name of pushing our students to do more and do it sooner. By doing this, we are burning our students out and making them dislike school because we are not keeping their mental development in mind!
- Please be more consistent with "A Framework for K-12 Science Education." For example, use the disciplinary core content from the Framework to minimize potential misunderstandings and gaps in depth of knowledge. For example, fourth grade energy is misleading. The draft AZ standard reads, "Students develop an understanding of how Earth;s resources can be transformed into different forms of energy. Students develop a better understanding of electricity and magnetism and how they are forms of energy." First of all, this is inaccurate and can lead to confusing ideas about energy. The
262. "Framework" states for this grade band "The faster a given object is moving, the more energy it possesses [kinetic energy]. Energy can be moved from place to place by moving objects or through sound, light, or electric currents." Using the research based language from the Framework supports the rigor of the concept. I would suggest at the very minimum checking the language with the "Framework" at grade level bands to the way in which the concepts in the draft AZ science standards are written.
- I have a number of concerned about the most recent round of revisions marked in green, which make the content less accurate. On page 4, it used to say that "The unity and diversity of living and extinct organisms is the result of evolution. I am a professional evolutionary biologist and educator, and find this to be an accurate and appropriate summary. It now reads "The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms." This new sentence doesn't even make sense to me. You don't need the theory of evolution to make clear the unity of genetic material or the diversity of forms - you simply observe them! This edit, presumably made just to put the word
263. "theory" next to evolution, strips it of coherent meaning. If you want to use the word "theory" of evolution, you could e.g. write "The theory of evolution links small-scale events like the evolution of antibiotics to large-scale events like the diversification of life on earth, within a single conceptual framework." This could parallel appropriate scientific use of the word "theory" in other places, eg "The theory of gravity links small-scale events like an apple falling down toward the earth with large-scale events such as the earth going around the sun, within a single conceptual framework." Instead, the edit replaces a clear and accurate statement with an incoherent statement whose meaning isn't even clear to a professional evolutionary biologist, and does not accurately reflect the process of science re observations vs. theory.
264. To broad standards, very rigor if provided us with materials to teach the standards so it will be more engaging and not just Theoretical in nature.
265. again; edit out "theory of " and just say "evolution"
266. See above for comment.
- It is unfortunate that we treat kids like they are too dumb to understand things, so we water down their education. Science is one place that should never be dumbed down or watered down. This set of
267. standards is not challenging enough to produce the future scientists that our state and country so desperately need.
268. I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and



pedagogically appropriate, unlike the proposed revision.

I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)

269. Why are you denying scientific knowledge re: evolution?

270. As sent by the 111 science specialists in November 2017 (left unchanged).

271. The changes are unacceptable.

272. Taking evolution out of Science is ridiculous!

This draft contains numerous changes that remove the term "evolution" or couch it in terms that make it seem to be "just a theory", not a solid body of proven scientific knowledge. I object to these

273. changes. Children in AZ need to learn about the process, causes, and details of evolution and natural selection. Any that attempts to dilute that learning does our children a huge disservice. Roll back these changes.

274. **[No Answer Entered]**

275. Language modification in regards to evolution fails truth logic.

276. The removal of vital information removes the depth of content and rigor of these proposed new science standards.

277. Needs to go back to review.

I am very concerned about any weakening or dilution of objective science standards by those who

278. question conclusions for religious or non-scientific reasons. This would \*not\* represent a rigorous application of scientific evidence and knowledge.

279. I don't believe the standards are developmentally appropriate for 5th grade!!!

280. Some standards are not included. Please review.

281. I like the connection to grade level math concepts and other academic disciplines but I question if the depth of content and rigor is developmentally appropriate. Who was involved in assessing this?

282. See above comment

Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution.

283. Please use the draft before the ridiculous edits.

284. There is important environmental and evolution content that has been changed or is missing.

The deletion of facts from science is disturbing and is a major disservice to the children of this state.

285. This is a great way to prevent technical jobs from coming to this state where the people are under qualified after receiving a sub-standard science education.

286. Needs review

287. The repeated refer to standard demonstrate a lack of depth in content.

288. Very brief in nature

289. Where is evolution? Among other missing scientific information. If you don't have a degree in a Science area you should not be involved in writing Science standards.

290. why do we always strive to attain the lowest common denominator. Challenge the students (and teachers) and you will be amazed at what they can do.

291. Wish they were more rigorous.

These dilute real science by replacing scientific content (evolution, Big Bang, theories) with non-

292. scientific words that are religiously motivated. I remind you that the Constitution requires separation of Church and State in all areas of government, which includes public schools. This is unacceptable to me as a taxpayer; Arizona is better than this.

294. This will work.  
My main comment is that the description of evolution throughout the document is inaccurate. In many areas throughout the draft (e.g., pgs. 42, 43, 69, 79, etc) the term "evolution" has been completely removed, which is inappropriate. In many other areas, where the term still appears, it is often written as "the theory of evolution" (e.g., pgs. 4, 20, 32, etc). This is very misleading, especially in the context of the draft's definition of "scientific theories" on page 76. Within the scientific community, representing thousands upon thousands of scientists across the entire globe, evolution is an accepted process. The evidence in support of evolution is overwhelming, and given this, it is not at all considered a "theory" in the way that the draft makes it seem to be. If students of all ages are to understand the mechanisms that give rise to all kinds of biological complexity across the world we live in, this issue regarding how evolution is referred to must be changed. Additionally, by mistreating scientific knowledge and evidence in such a way, it allows any sort of evidence and information to be pushed aside if someone simply does not agree with it.
295. I am commenting on the DRAFT Science Standards from the Committee NOT as amended by the the ADE staff and Superintendent!  
Two main issues:
1. The scientific method. The primary focus of the curriculum should be familiarizing students with the core practices that constitute the scientific method. The practices should be emphasized at every stage, regardless of sub-discipline; the scientific method is the foundation upon which all scientific knowledge is constructed. The misleading statement "Formerly known as the scientific method, the science and engineering practices" should be replaced throughout by "the scientific method". As a scientist, I can assure you that there is little to no controversy among scientists themselves regarding the core practices of observation, hypothesis formation, experimentation, prediction, falsification, replication, etc., that we use to determine what is true and what is not true about the natural world. At the K-12 level, there is nothing to be gained by confusing children with minor controversies before they have learned the fundamentals.
297. 2. Evolution. The original draft is reasonable, but recent edits in "Draft w/Internal Review: AZ Science Standards" are nearly all changes for the worse with respect to the teaching of evolution. These changes seem focused on implying uncertainty where none exists (among scientists, that is; doubts may exist among some religious groups, but the purpose of the science education is to teach science, not public perception or opinion of science). A good example is the replacement of the sentence "The unity and diversity of organisms, living and extinct, is the result of evolution" with "The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms". The former is clear and easily understood statement of a scientific fact which is the foundation of biology. The latter is a string of weasel words clearly intended to strip the former of its clarity. (For example, what does "to make clear the unity and diversity" mean?). I certainly would not let a student get away with writing such a meaningless sentence.
- To be clear: in every case, the recent changes to sentences and paragraphs pertaining to evolution should be reverted to the original version.
- It is imperative that the science standards include a clear teaching of evolution. It appears that this has been removed from the draft that is on the website. Evolution is a unifying concept that informs all of biology, from the functioning of molecules, cells, tissues, whole organisms, to ecosystems.
298. Biological change through evolution is no longer a hypothesis; it is a well established fact supported by over a hundred years of research. We do our children and citizens a disservice if we do not educate them plainly about evolution.
299. the removal of scientific terminology is unacceptable .
300. They don't if it doesn't include evolution.
301. I have not read the full draft, so have no comment on this
302. To teach creationism theory without covering the evolution theory is limiting what science has proved in what is taught to students. The Bible is not proof. Science is about asking questions and then seeking facts to prove or disprove. Creationism has never been proven so it should be taught as only a thought not fact.
303. Why are areas that are politically controversial being watered down regarding the actual science that isn't controversial? Such as the Big Bang and Evolution? Just because a scientific fact makes someone uncomfortable or makes them question their own beliefs doesn't necessarily mean it needs to be avoided. What if math makes someone uncomfortable should it be more general or avoided?  $2+2 = 5$ , like Stalin's 5-year social program only taking 4 years to finish?  
Here are some specific examples of areas that have been unnecessarily altered:

The omission of absolute ages in 8.E1U1.6;  
the use of the word "may" in 8.L4U2.11 and HS+B.L4U1.19;  
the failure to use the word evolution in 8.L4U2.12, HS.L4U2.31, and HS+B.L4U2.20;  
the omission of the Big Bang in HS.E2U2.17

304. Evolution must be included in the science standards
305. Evolution needs to be explained and understood from K to 12.
306. The practices being integrated with the disciplinary core ideas has increased the depth of knowledge for the standards.  
I recommend revisions to the treatment of evolution and allied topics in passages that seem to have been deliberately weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in 8.L4U2.11 and HS+B.L4U1.19, the failure to use the e-word in 8.L4U2.12, HS.L4U2.31, and HS+B.L4U2.20, the omission of the Big Bang in HS.E2U2.17).
307. "may" in 8.L4U2.11 and HS+B.L4U1.19, the failure to use the e-word in 8.L4U2.12, HS.L4U2.31, and HS+B.L4U2.20, the omission of the Big Bang in HS.E2U2.17).  
The removal or obfuscation of widely accepted scientific information and theories (e.g. Evolution and Climate Change) is highly disturbing and counter to the fundamental purpose of primary and secondary education - to prepare youth to be active, knowledgeable, and productive members of society after they leave school. Censoring valid, peer-reviewed science because of theocratic dogma (especially when not all faiths embrace the same dogma) is only going to accelerate the decline of the United States from being a worldwide leader in innovation and scientific research to becoming eclipsed by most other nations in these areas. Science begets innovation, Innovation begets new jobs, New jobs begets economic prosperity for the future.
308. (especially when not all faiths embrace the same dogma) is only going to accelerate the decline of the United States from being a worldwide leader in innovation and scientific research to becoming eclipsed by most other nations in these areas. Science begets innovation, Innovation begets new jobs, New jobs begets economic prosperity for the future.
309. See above comment.  
My concern is that they are not developmentally appropriate, especially at the younger levels. Please remember that these children are 5-8 years old. I understand the desire for more rigorous content, but it must be realistic as well.
310. remember that these children are 5-8 years old. I understand the desire for more rigorous content, but it must be realistic as well.  
I believe the earlier concepts of reproduction and physical health should be taught as early as third grade (about age 8-9), when children are asking questions, possibly enduring sexual abuse outside of school, and are experiencing earlier and earlier puberty. Waiting until 7th or 8th grade is far too long.
311. grade (about age 8-9), when children are asking questions, possibly enduring sexual abuse outside of school, and are experiencing earlier and earlier puberty. Waiting until 7th or 8th grade is far too long.
312. If the NGSS was fully adopted, the standards would automatically have sufficient depth of content and rigor.
313. what kind of depth can there be and why bother teaching geology, humanities or even math, as it must be all wrong if the earth is only 8,000 years old. anything else you want to refute?
314. Evolution has been eliminated.  
"Creationism" is NOT science but thinly veiled theology. It has not and, cannot have a place in the public classroom. Do what you will at home but, "Intelligent Design" is merely the repackaging of a discredited and ridiculous mythology.
315. public classroom. Do what you will at home but, "Intelligent Design" is merely the repackaging of a discredited and ridiculous mythology.
316. Certainly no depth or rigor when it comes to evolution. KEEP RELIGION OUT OF THE SCIENCE CLASSROOM!
317. Any standards that allow for the deletion of the words "evolution" and "evolve" that are replaced with creation science terms are neither deep nor rigorous.
318. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
319. As a physician and scientist, I don't want my future medical care providers learning that science is only one way of explaining our world or that the earth was created 10000 years ago.
320. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
321. This is science class, not religion. Get rid of religion and teach evolution correctly.
322. It's unbelievable that ignorant religionist can foment their religious fairy tales as science. This is completely unacceptable to anyone who is rational.
323. creationism and "intelligent design" are NOT science!
324. Science, facts, theories
325. Creationism is not a reflection of rigor.  
Based off "general impressions of the organization, content, and rigor of this DRAFT, and recommendations to the State Board." NO. How is removing science from the science class giving sufficient depth of content?
326. recommendations to the State Board." NO. How is removing science from the science class giving sufficient depth of content?

327. The lack of evolution-related content is worrisome. Evolution is a key theory in biology that unifies many areas of thinking. It must be taught if we want our graduates to be competitive on the job market or to succeed in universities. The NGSS devote more space to evolution. We should as well.
328. Send the standards back for review.
329. Needs more explanation of evolution .
330. Remove Intelligent Design from the science standards.
331. Again, there's no depth if it ignores Evolution, and it's nothing but sophistry and lies if it includes so-called "Intelligent Design"!
332. Content looks sufficient with rigor depending upon teachers
333. Scientific method should be the basis of science education not religious doctrine which is not based on facts. Faith is fine for religious education but not science education.
334. See the above comment regarding evolution. You are omitting key facts that enable modern biological research into medicine and treatment.
335. The standards, 'creationism', have no depth of truth and fact.
336. No science curriculum that eliminates all references to the words "evolution" and "evolve" can claim to have depth and rigor. Is this the Middle Ages?  
I have some suggested small edits.  
For grade 3, L2U1.8, consider the change Use food chains to Use food webs...
337. For grade 3 L2u3.9, consider having students explore the damaging effects of drought rather than sunlight. Drought is a more relevant problem in AZ in the future than too much sunlight, or include both.
338. Do not further undermine the science curriculum by downplaying the inherent critical thinking skills that are necessary for the pursuit of empirical, evidence based truth in order to appease the anti-science communities.
339. These standards are way too rigorous for students who are, in many instances, unable to construct an English sentence. More realistic standards should be formulated and then actually enforced.  
To say that evolution is "just a theory" demonstrates a gross misunderstanding of science. Biological evolution is not "just a theory", it is the most robustly demonstrated theory in all of science. By omitting this fundamental concept and achievement of the scientific method severely disadvantages the children of Arizona. They will not be able to compete with the jobs of tomorrow. Job in bio-science and medicine make money and cure diseases because they are founded on reality: the reality of evolution.
340. Do not let ideology or ignorance hold our future back. Put evolution back into the curriculum. Facts aren't ideology. Evolution is a fact. You test it every time you get a flu vaccine or eat food from plant and animals humans have changed and domesticated over the last 10,000+ years.  
  
Shame on Diane Douglas. Keep your religion out of our schools.  
If you are not teaching evolution and the beginning of the universe to our students, you are not teaching them everything. I remember first reading about the Big Bang theory in 1968 in a school library book. Your attempts to remove generally settled aspects of science in favor of sectarian dogma is noted and opposed.
341. See above
342. See above
343. See above. Do not water down evolution!  
Again, including the religious doctrine of creationism in a required science class renders the standard inferior. Further, if the claim is made that students should be given "alternate theories," then there
344. six-dozen other theories that would have to be crammed into the curriculum:  
[https://en.wikipedia.org/wiki/List\\_of\\_creation\\_myths](https://en.wikipedia.org/wiki/List_of_creation_myths). A science class should be dedicated to science, not promoting any religion, let alone one over another.
345. Promotes non scientific thinking
346. Removing the word EVOLUTION weakens the rigor.
347. The \*theory\* of evolution should be taught in depth while the \*belief\* of intelligent design should not even be mentioned in a \*science\* class.
348. Because of the amount of standards teachers are required to uncover with their students, depth of

- coverage is impossible.
349. When you base science on unsubstantiated intelligent design you lose all sense of rigor and veracity.
350. Evolution must be clearly included.  
There is no depth or rigor in the life sciences without evolution. Evolution is the unifying principle of biology and life sciences. Our health and medical training is based on evolution, our agricultural practices and principles are founded on evolutionary principles. Life on Earth cannot be understood at
351. a rigorous level that allows for creative thinking and solutions to challenges in the 21st century without a strong and correct understanding of evolution and the evolutionary process. Evolution is a fundamental trait of all life on Earth and helps us to understand and appreciate the nature of all life on a richer and deeper level.
352. This is why we're dead last. You want text books to look like they did in the 50's.
353. Any science content must contain the theory of evolution as defined by science.
354. Teach evolution leave religion to the zealots.  
These standards are not rigorous enough. You should look at the higher expectations that the Next Generation Science Standards require. Look at Massachusetts, Virginia, New Jersey, and New York for examples of rigorous science standards and end of course exams. If we want Arizona students to be
355. taken seriously when they apply for positions in universities, they must have higher science standards. Look to other states as role models or adopt the Next Generation Science Standards. The NGSS are already good standards.  
The concept of evolution is an evidence-based proven scientific theory upon which understanding of
356. the natural world is based. The words EVOLUTION and EVOLVE MUST BE INCLUDED in the Science Standards of Arizona's public schools.
357. Evolution is science. Period.
358. No, they cover science as a series of facts, not as a rigorous process of gaining knowledge.  
Depth of specific fact and content knowledge is good. HOWEVER rigor in science is reached when students practice science. There are no standards about the process of science and using science
359. inquiry to explore these topics. And IMO there is a difference between science and engineering. Science is exploration of nature using evidence and experiments. Engineering is applying what is found out in science to solve problems.
360. you wouldn't let the books talk about allah so why jesus - keep it out!
361. All science needs to be included including evolution.
362. Continue to teach Evolution. Do not remove it to teach creationism
363. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
364. There is no rigor involved in an imaginary non-science based idea.
365. Please do not remove to concept of evolution from state teaching standards.
366. As re-written by politicians, these standards lack credibility and content. Please restore these standards to what the science teachers originally wrote.
367. I think that using the Framework and NGSS as a reference helped with the depth of content and rigor.
368. Without explicit referral to evolution, the Science Standards are sadly lacking in scientific rigor.
369. The science standards are inconsistent in the way they represent the depth and rigor. if fact, the rigor is less evident than in the previous standards
370. Not enough about evolution -- a proven scientific subject  
I repeat: The tenets of scientific method are based on what has proven to be true. We have DNA, we have fossils, we have hard evidence to support what we teach in science. We need to always promote inquiry, but we also need NOT to disregard what we have found through rigor and evidence.
371. Creationism, intelligence design are beliefs and should not find their way into science. Somewhere else, maybe, but not science. Downplaying evolution and designating it a theory without validating its scientific credibility runs counter to what defines science. Rigor depends on serious and disciplined inquiry, not belief.
372. I don't really agree or disagree with this question, but the main question to ask is whether students



will truly be prepared for their next step in life, whether it is career or college. If students are not taught to reason and use logic, they will not move forward in the learning process. The basis of high school science is to give them a firm foundation on which they can grow and without that foundation, the topic becomes useless.

I repeat: the tenets of scientific method are based on what has proven to be true. We have DNA, we have fossils, we have hard evidence to support what we teach in science. We need to always promote inquiry, but we also need NOT to disregard what we have found through rigor and evidence.

373. Creationism, intelligence design are beliefs and should not find their way into science. Somewhere else, maybe, but not science. Downplaying evolution and designating it a theory without validating its scientific credibility runs counter to what defines science. Rigor requires serious and disciplined testing of hypotheses, and then the recognition of results as valid.
374. too vague
375. Taking out important content
376. See above
- The depth of content is diminished.
377. "Nothing in Biology Makes Sense Except in the Light of Evolution" is an essay by Theodosius Dobzhansky, a world renowned biologist. Read it, and then decide how much depth there is in Douglas' nonsensical standards.
- Depth seems to be missing from the essential standards, which could lead to a lack of rigor in
378. practice. The essential standards as written seem to offer little guidance to students and teachers in terms of just how deeply one is to explore.
379. Depends what depth you wish children to learn at. I think they could be much more rigorous.
- These standards are lacking in rigorous teaching of the scientific method as the underpinning for our understanding of the world around around us. This should be clearly taught at all levels with
380. emphasis on its application rather than on controversy. Additionally, they contain phrasing that implies doubt that does not exist among scientists as to our understanding of the role of natural selection and evolution in the origin of species and biodiversity.
381. when you spiral you generalize ideas, will be hard to go deeper into content without stepping on the toes of the other two grade levels.
- Evolution needs to be taught. Religious beliefs such as intelligent design should not be taught in
382. public schools. This promotes ignorance and will promote that the students of Arizona lack fundamental knowledge of science.
- The lack of sufficient detail about evolution, the major theoretical basis of all of biology, absolutely must be fixed. We as a state cannot be putting ourselves even further behind.
383. In addition, the inclusion of 'key concepts' goes against the Framework on which these standards are based. A focus on 'big ideas' is essential. This means that individual teachers can determine the best path to these big ideas. By adding the 'key concepts' section for each standards, we once again focus on smaller ideas and facts as opposed to big ideas. NGSS has done this right and it has shown itself to be the way forward for science classrooms across the nation.
384. See comments below
- The downplaying of biological evolution and the outright removal of the Big Bang from the science
385. standards can be seen as a disturbing concession to anti-scientific and pseudoscientific argumentation. Restoring the content regarding these subjects vetted by PhD biologists and astrophysicists would be appropriate.
- any science standard that proposes to eliminate or redefine the foundation of biology and the theory of evolution is lacking content and rigor. without the theory of evolution, our children will lack depth
386. of understanding and the rigor of accepted scientific knowledge. they will be totally unprepared for higher education, or for jobs that require the common knowledge expected of them in the science community where evolution is the understood, scientifically based and accepted theory of all living things. religious concepts are no substitute for accepted scientific theories.
- I am only commenting on elementary school levels. For these, the standards actually seem a lot more
387. ambitious than what is currently achieved in schools. So, I like the depth of content and rigor, but I wonder about implementation, e.g. enough teacher PD to realize these aims.
- The green edits in some places significantly weaken the rigor by confusing terminology.
388. Students should be taught that all science is theory, not dogma.
389. The depth is great. I am a bit worried about teaching types of bonds and reactions to my eighth



graders though with just having an introduction to the periodic table in fifth grade. Although they should understand atomic bonding at this phase, it would be helpful to include patterns in the periodic table at the eighth grade level.

I LOVE how energy is transferred from sixth grade (2014 standards) into the eighth grade standards. This seems more cohesive to me.

I also agree with taking time to learn about morale types of conflicts, such as genetic engineering, in eighth grade. I think this helps students understand the field of science as a whole.

390. There is no mention of Charles Darwins evolution theory.
391. The teaching of evolution and biology is has been weakened.

Rigorous science considers all possible explanations for an observation and uses the Scientific Method to evaluate them. Since some observations cannot be repeated under controlled laboratory
392. conditions, proposed explanations of those observations are called hypotheses, not theories. Neo-Darwinian evolution is an example of a hypothesis which is incorrectly called a theory and treated as fact, which is a violation of scientific rigor.
393. See number eleven.
394. eliminating deep discussion of evolution of plants, animals and humans takes away from the factual scientific education of our children.
395. Quantum mechanics proves Reality depends on a process external to it.
396. There is no rigor and the depth is razor thin. On both account it is embarrassing
397. The changes imposed by the Department of Education have greatly damaged the relatively suitable version that came from the updating/revising committee. It is simply unacceptable in 2018 to downgrade evolution (which no longer is a theory but established fact), global climate change ( which is established fact based oin evidence), etc.

The AZ Department of Education's revisions of the language used when discussing evolution is concerning because it is incorrect and contradicts other parts of the document. It is confusing because evolution is mentioned within the document but correct language has been altered. On page 43: "They also develop the understanding of how traits within populations change over time" - this is, itself, evolution but language around how adaptations contribute to evolution have been struck through. Again, page 69 contains the following objective: "...explain the change in genetic composition of a population over successive generations." Yet "mechanisms of biological evolution" has been struck through. The change in genetic composition of a population over time (this is evolution) is explained by multiple mechanisms (bottleneck, natural selection, etc.). The only reason I can see to why these revisions have been made is because there is an inappropriate anti-evolution bias from the AZ Department of Education. These changes are not subtle, and will deteriorate the quality of AZ education.
398. The "rigor" of the content is compromised by the authors' attempts to skirt around topics such as evolution and the big bang theory.

The addition of a column of "key concepts" to the standards' detail are listed only as simple terms, without connection to crosscutting concepts or the science and engineering practices. The result is a shift of teacher focus from rich connections in the standards themselves to a simplistic list of content-
400. only terminology. The key concepts become simply another checklist for teachers, restricting and confining instruction and assessment, and keeping them from getting to the deeper levels of understanding required for effective science teaching and learning.
401. Diluting evolution is diluting content and rigor.
402. TEACH TRUE SCIENCE INCLUDING CLIMATE CHANGE AND EVOLUTION. KEEP RELIGIOUS DOGMA OUT OF CLASS!
403. Comply with scientific fact, thoroughly.
404. We need to teach fact-based, not faith-based, science.
405. It seems like the key concepts seem to water down the content.
406. The key concepts water down the depth.
407. Good additions to make it more specific and complete
408. See my comment above. How does your science curriculum prepare young people who do not want to

attend college to enter the world of working adults?

409. fine

410. There is a tremendous lack of detail and insight on evolutionary theory.

411. Please stop underestimating the capabilities of our students. Give them more and they'll surprise you.

412. Science is real. Preach what you believe at your church.

Some of the content relating to a religious or metaphysical bias must be eliminated. Public education  
413. is stronger and more rigorous when scientifically dubious information is not included. There is no place for religion in the standards, especially in science.

414. There seems a reluctance to address evolution as evolution, the scientific basis for studying life.

415. Creationism should not be taught in Arizona schools.

As above, As an engineer and science advocate I strongly disagree with the watering down of  
416. Evolution and its importance in several branches of science. We should never allow supernatural models to be allowed into public education.

I am horrified that religious creationist garbage is being inserted into curriculum by a religious zealot.  
417. We do not want to become more uneducated as a nation. Intelligent design has no place in a public school curriculum

418. Creationism...or whatever wording you are using to confuse people...really?

The following terms are missing and should be added:

3.L2U1.8 and 7.L2U2.10 --> decomposer

419.

--> Global Climate Change (it's here, it's happening)

Biogeochemical cycles --> Nitrogen cycle (76% of our air, in DNA, in protein)

Removal of specific reference to evolution and/or any attempt to conflate religious creation stories  
420. with scientific theory is inappropriate. Evolution is the best available scientific theory in support of the origins of biological diversity. Failure to specifically educate about accepted scientific theory is a huge step backward in our educational process.

Depth is fine, except the creationism in favor of evolution needs to be deleted as a Christian and  
having a B.S in Psychology I have studied Biology and Chemistry and believe despite Christian  
421. theories, evolution is a non disputable fact. Creationism should only be taught as alternative theory in religious church of the parents choose and Evolution needs to continue to be taught as the only reality in Public schools.

422. Science standards, after bureaucratic revision, lacks rigor and understanding of what a 'theory' is.

The lack of information pertaining to the way inherited traits and characteristics link to evolution is  
unscientific and unacceptable. We cannot allow pseudoscientific rambling and anti-science bias to  
423. infiltrate our schools. Arizona students must be prepared to compete with their national and international peers- and that means being informed about evolution and its 200 plus years of consistent support in scientific research.

424. Rigor is what scientists, paleontologists, anthropologists, geologists, bioscientists, biologists, genetic scientists, and others have used to prove the theory of evolution.

425. AZ science standards can be too broad, meaning students have to memorize information instead of gaining good understanding of the scientific process.

426. Just stop

427. Needs to include evolution.

428. If you teach about gravity-teach about evolution NOT a religious belief. Go to church on Sunday for that....

How do Arizona's teachers feel about the depth and rigor of the Science Standards. They are the  
individuals who teach students every day in the classroom; they're the ones who have the education  
429. degrees and certification; they should have the final say about the depth and rigor of the Science Standards.

430. Intelligent design is a religious propaganda not science. Remove it from this standard

431. Depth is also lacking. Why is the concept of evolution described, "The theory of evolution seeks to

make clear the unity and diversity of living and extinct organisms."? Evolution is about change through time. What about 'unity and diversity' explains evolution? Also, why is engineering given so much prominence to the detriment of other sciences. What about social sciences?

432. Huge mistake removing evolution
433. Agree
434. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
435. Teaching creationism in school is an unconstitutional endorsement of religion in tax payer funded public schools. Any effort to introduce this into school curriculum will be met with strong opposition. Evolution must be studied and understood as a fact, in order to continue to progress in science in higher education. Removing it by calling it a theory or to introduce other, made-up imaginary ways organisms change (which is what, exactly?) is not doing right by our students. We would not be preparing them for college and for futures in science if we teach them some bogus crap about a higher being IN SCIENCE CLASSES. Religion--and religious theory--has NO PLACE in science classrooms.
436. The standards do not present sufficient depth to the teaching of evolutionary theory, particularly in regard to arguments being posed by scientists both academically and in the mainstream press. Students need to be familiar with the arguments both for and against Darwinian evolution.
437. Adding and maintaining teaching Evolution needs to be continued.
438. 2018 Science Standards are fatally flawed by the suggestion that evolution, excludes the theory of evolution as explained in detail in Darwin's On the Origin of Species (1859).
439. Evolution a geology need to be taught as they are understood by modern science, and not as a fundamentalists Christian believes they should be taught.
440. The 8th grade standards are too numerous to allow a significant depth of content in the given time before AIMS testing is administered. Evolution is change on both the micro and macro level, leading to the inability of species to interbreed. Changing the curriculum to replace the word 'evolution' to 'diversity' will allow teachers to teach religious interpretations rather than scientific. Religion has its place and science has its place.
441. Today, we all know that the sun is the center of the solar system and not the Earth. Back then, the Church banned this belief since it did not match their interpretation of the Bible. Taking out all reference to evolution and not teaching it as scientific fact, is a step back to the age when religion tried to negate scientific reality. If Arizona students are to be taken seriously in the real world, they need to have an education based on reality, not fiction.
442. Removing all mentions of evolution is absolutely unacceptable for children who need to be competitive in STEM fields.
443. Depth is sporadic, rigor is appropriate.
444. Science should only teach scientific theories based on science. We need to leave religion to the home and church. It has NO PLACE in our publicly funded schools!
445. Agreed
446. Teaching evolution should be broadened and more depth added to the curriculum not removed.
447. Leave religion out of the schools and stick to the facts of science.
448. Science rigor goes out the window with the theory of intelligent design.
449. Evolution is necessary. You can't take science out of science curriculum. Same as above. There seems to be no rhyme or reason for some of the choices. It does not seem, for example, that you had Earth & Space teachers working on the Earth & Space curriculum parts. Do you have the appropriate people working on this curriculum?
450. The changing of how evolution and the Big Bang represented in the standards is a disservice to intellectual rigor of Arizonans. Without using the proper diction, this opens to door to validating teaching of outdated hypotheses, factually fragmented ideas, or mistruths. This is embarrassing.
451. Theory of Evolution is not a guess, there is science to support it.
452. Hard to know exactly as some of the wording allows for some flexibility (which can be good in certain topics)
453. Arizona students cannot be expected to compete on a world stage if science is dumbed down to meet

the comfort zone of uneducated people. The ability to analyze data is core. Also, there is a difference between core and essential, the later being subjective and vulnerable to the whims of those who would twist information to suit their point of view. Core is immutable. Evolution is not some dirty word. It is a body of evidence.

456. Refer to above.

457. The content is there, the rigor will be applied by the teachers.

458. The rewrite/change on evolution removes depth of content.

459. See comment #9

I am specifically concerned about language that tends to downplay the validity of evolution in the curriculum. The wording has changed from the previous draft, which better represented the scientific consensus about evolution. If our students get the training that evolution is just a possibility rather than a reality, this is doing them a great disservice, especially if they plan to go on to a life sciences career. This is not rigorous training for our kids

460. You can't remove the word "evolution" and consider your standards to have "depth of content and rigor".

461. See comment above

462. De-emphasis of evolution does not advance science education. There is no scientific controversy about evolution.

463. Teaching your religion takes valuable time away from serious scientific endeavors. You have no right to teach my kids your religion; I don't want their time at school wasted on that. Only science belongs in science class.

464. The depth seems appropriate to me, although I am not a scientist or well-versed school administrator, and therefore don't think my opinion is necessarily valid here since I don't know what is "normal" across the US for depth of going into these topics.

My comments pertain to Biology as that is the subject I teach. Evolution is the fundamental theory underpinning Biology. It should be taught from the earliest ages and should be used to show how all living things are connected. For example, I note that your standards state that living things are organized in groups based on similarities. This is outdated. Modern taxonomy is based on evolutionary relationships. Groups contain organisms that are descended from common ancestors.

465. Evolution also explains the similarities we see in the physiology of different species and how widely disparate creatures can have virtually identical genes. Evolution is settled Science in the same way that Gravity is. It is not a matter of debate in scientific circles (though details of mechanism and the relative importance of different factors affecting aspects of evolution may be), it is the organizing theory that makes sense of the vast amount of material included in the discipline of Biology and should be taught at each age group and related back to all other aspects of Biology such as physiology, taxonomy, genetics and biochemistry.

466. They are satisfactory.

467. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.

468. The key concepts do not provide enough depth and rigor in the descriptions. Omitting these and focusing on rigorous performance objectives that leave little room for interpretation should be considered.

469. Ok

470. Doesn't seem to encourage science fairs and the competitions that help grow young minds.

471. Not when content is incorrect and misleading, see above

472. The content is not based on science!

This content not only lacks depth and rigor, it is dishonest. It teaches untruths to science students by falsely claiming that the PROCESS of evolution and the resulting BIOLOGICAL DIVERSITY are the same thing. It also lacks depth and rigor due to omitting mentions of evolution, thereby omitting the critical working scientific theory (not the same as a layman's theory) of the entire biological sciences. This is an attempt at mind control of the youth of the entire state. This forces the religious rights' unsupported beliefs in the illegitimacy of science and the knowledge-creating process on students by failing to instruct them correctly in the knowledge of how life on this earth developed. It fails them and it fails the education system, which is based on critical thinking.

473. Rigor without political/religious deception.

476. Science standards should encourage critical thinking and evaluation of the evidence relating to evolution.
477. Same as 11.
478. The Science standards are compromised by diminishing the role of evolution.
479. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
480. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
481. Superintendent Diane Douglas has removed key scientific concepts from the AZ Science Standards in a misguided attempt to inject her personal religious views into public education for all Arizonans. Standards relating to Evolution and The origin of the universe, specifically the Big Bang, have been corrupted or removed. She should be ashamed.
482. If you omit evolution and "big bang" terminology you are effectively diluting the content and scientific rigor
483. The watering down of evolution in the proposed curriculum standards is a huge disservice to Arizona students and teachers. The suggestion that key tenants of evolution are being actively debated is a faith based argument that undermines the rigorous collection and analysis of data that goes into the development of scientific theories.
484. While the work of the Science Committee is more than sufficient, the red line changes made to the committee's draft are not appropriate. There is a big difference between a theory, such as an idea Sherlock Holmes might have, versus a scientific theory, which is an evidence based conclusion. I'm rather disturbed we have people running our State Schools that doesn't understand the basic principles of evidence based science.
485. Repeated attempts to discredit and obscure the well supported and accepted theory of evolution by natural selection as the driving factor for the diversity of life on Earth.
486. The standards for 9-12 are similar to middle school standards in the East coast districts, Not to mention that schools in Europe and East Asia have higher standards.
487. As a parent whose first child will soon enter the public school system in Arizona, I am strongly opposed to the draft changes in the Science Standards regarding evolution. Specifically, the Core Idea for Knowing Science L4 edit seeks to remove empirical scientific understanding by conflating it with other belief systems not based in science. I strongly disagree with the edits to the 8th grade and High School Life Sciences, which remove references to evolution and cast significant doubt on their universal scientific acceptance. The Theory of Evolution, much like the Theory of Gravity, is widely accepted in the scientific community. Moreover, it represents knowledge gained through scientific discovery and the use of the scientific method. Students, families, teachers, and administrators can choose to believe anything they desire, but these are "Science Standards", not "Belief Standards". To imply that evolution is one of several scientific explanations for our world is simply disingenuous and does a disservice to our students. Please don't attempt to "fix" the standards regarding evolution; it is not broken.
488. Religious classes and Science classes are different.
489. Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
- Please don't avoid education on evolution.
490. The science standards at points seem overly-specific - I disagree with the statement regarding Standards and Curriculum - the specificity of the standards makes it function as a mandated curriculum.
491. Teach facts, not beliefs
492. The original structure, before internal review, was a well-organized representation of Arizona science content experts as well as evidence-based concepts.
493. Including anything even alluding to intelligent design and misrepresenting evolution as a theory based on conjecture says enough about the content and rigor. It is not rigorous at all to write off the entire scientific body of knowledge on the whims of a deranged religious lady (who somehow became Superintendent). There is no depth to anything involving intelligent design, as it simply amounts to "because Jesus" and that's it. If Diane Douglas wants to teach her misguided and ignorant worldview, she should go find a private religious school to do so.



494. With encouraging students to explore additional ideas and theories, they will better understand science and deductive reasoning.
495. The changes weaken the standards. Evolution needs to be included.
496. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
497. Teach science in science class not beliefs.
- I again disagree with the removal of the word evolution and the attempt to cast doubts about the validity of evolution. I am amazed that a first world country, with people that have achieved marvelous miracles through science, could have people that still believe in creation. I do not know the reason for this, but I am just appalled. How can one explain basic facts of evolution to a person that simply refuses to see what DNA and the fossil record proves? People with obtuse minds fail to understand and confuse theory with speculation. Everybody sees the effects of gravity, nobody doubts it, and yet, there is a theory that tries to explain how it occurs. The same happens with evolution. Evolution is a fact, and the theory tries to explain how it happened.
- 498.
499. Evolution is the science. It should be stressed that there is no evidence-based alternative worthy of even being mentioned in the curriculum.
- The relative merits and rigor of different approaches to discovering new knowledge are not adequately addressed. For instance, students will not come away with a strong, personal understanding of how and why observational data has different merits and limitations than experimental data. This is critical to EVERY domain of knowledge, yet is severely lacking in these standards. Also, established knowledge is referred to in the standards, misleadingly, as theories. Not only that, but also the difference between colloquial meaning and scientific meaning of the terms fact and theory are not addressed, and no personal understanding and experience of the differences between those are required for students.
- 500.
- The future of our economy and nation will rest on our children having the rigor to design quality experiments, have experience conducting primary research at a young age, and firsthand, hands-on experience with currently cutting edge technologies. Where are the requirements for this?
- The concepts do not have sufficient depth. Earth science is more heavily leaning towards Space science. Also, there are strong emphasis on climate which is good but you miss some key concepts in water systems and erosion for example. Wind and water are not the only culprit in erosion. Water takes the easiest path every time. What causes those paths in the first place? Cracks...what causes those cracks? Faults? Sometimes or fractures etc. In the end we've got larger processes such as tectonic plates that will greatly determine the geography of your surface and then water and wind
501. come in to take advantage of the results. In either case, climatology, space science, earth's layers and tectonic plates etc...they all have one thing in common. They are all subcategories of Geology. Apparently, you don't understand that. Geology is where you should start then break it down into categories as they move through the grades. Also, these kids will know more about Mars than they will the soil under their own feet. It's easier to teach about other planets once you understand Earth better by the way...because than Earth gives you a point of reference to which you can demonstrate difference between Earth and the next planet.
502. It isn't in depth. It's denying scientific evidence.
503. I strongly object to the changes made in the draft Arizona Science Standard core idea L4, to remove or downgrade the Theory of Evolution from a fundamental principle causing diversity and change in all life forms to a mere explanation of that diversity. Understanding the Theory of Evolution is critical to an informed citizen being able to interpret medical/health, environmental impact, and sustainability issues in today's world. I would re-label the original L4 as L1 because understanding the Theory of Evolution is critical to understand the others.
- To a scientist, "Theory" means that a concept has been tested and confirmed numerous times by many experiments that are found to be valid and repeatable; namely, it predicts the outcome of the experiment. Thus, we speak of the Theory of General Relativity or the Theory of Gravitation because they provide explanations for natural phenomena when tested in a multitude of ways. Likewise, Evolution, has been tested and found to predict changes in organisms subject to various natural stimuli. For example, see <https://www.scientificamerican.com/article/darwins-missing-evidence/>. Alternate approaches to the evolution of life must meet the same criteria as the Theory of Evolution for them to begin to be considered as science.
- Evolution explains and drives the changes that have occurred in nature better than any other attempt. It has been validated through countless experiments and mechanisms. Finally, recent



understanding of Biology and the propagation of species though DNA provide the mechanism for Evolution to occur and increase our confidence in the validity of Evolution. Not understanding the concepts of Evolution represent a significant gap in the scientific literacy expected of any well-educated person today.

To not inform students of the Theory of Evolution is gross neglect of the principles of science and potentially will condemn those students to a lesser ability to develop scientific and technological careers as they progress through life and as they compete nationally and globally. Students need to know the principles of informed skepticism: that is, to question motives, methods, biases and results, then assess the evidence for and against the topic being considered.

To say that evolution is, "wrong", and that a being in the sky created the world is stupid, and you are a stupid official for espousing it. You are an idiot for even considering this Ms. Douglas, much less implementing it in 2018.

See comment above. Good work in the Science Standards in many subjects; however, Arizona students will not be prepared for life in the 21st century unless more emphasis placed on learning the effects of living sustainably (and not sustainably!) with environment.

Evolution should be taught, clearly, in our schools. Anything otherwise is a violation of the separation of church and state.

See above

The standards 8.L4U2.12 & HS.L4U3.31 do not instill rigor because they both use soft language to describe a highly scientific, proven theory. The language used allows for interpretation and misinformation, which is the opposite of depth of content and rigor.

I strongly agree that the standards are designed with the depth of content and rigor for all areas except the inclusion of the theological ideology of intelligent design in place of evolution. The theological ideology of intelligent design belongs in the studies of religion.

Science standards are adulterated with unscientific content, making them less rigorous in teaching science.

You can't have the depth if critical information is missing entirely (see above). Something I believe this document does well is to encourage critical thinking.

Denial of evolution is equivalent to claiming the world is flat. This does a disservice to all students and simply represents the religious bias of the state leadership.

We need evolution taught in AZ.

As changed the introduction of intelligent design is not appropriate, return the draft to the one presented by the teachers.

There are a few places where the "key concepts" are misleading oversimplifications. These serve more to confuse than to clarify. For example, "chromosomes which determine gender at conception (XX, XY)" is found in both the 8th grade life science standard (8.L3U1.9) and the high school life science standards (HS.L3U2.28). Firstly, the term that should be used there is "sex" not "gender." In most scientific usage, gender refers to a cultural performance while sex refers to a biological characteristic. Second, while the use of XX and XY chromosomes is not uncommon among sexually reproducing species, it is by no means universal. Students in high school should be expected to know something about species which do not use the XX/XY sex determination system.

This is just an example, but it is illustrative of a lack of thought and care in the current draft, especially in the key concepts area.

Please see comment #11. By the way, Arizona schools scored a D+ (50th out of 50) according to a Quality Counts report that was released this year: [http://tucson.com/news/local/study-arizona-education-system-earns-grade-of-d-plus/article\\_c87eec48-bcf5-52c0-8c73-c512e3c23ee3.html](http://tucson.com/news/local/study-arizona-education-system-earns-grade-of-d-plus/article_c87eec48-bcf5-52c0-8c73-c512e3c23ee3.html). Congratulations. I'm sure this move will help sink our state's grade to F. Awesome job, Diane Douglas.

Downplaying evolution in our schools will severely hurt our students as they try to get into more rigorous schools and jobs.

Any modern scientific standards that ignore major conclusions from scientists about climate change, evolution, and big bang cosmology are not sufficient science standards. These are the conclusive results of the research from the scientific community and cannot be simply ignored because politicians disagree with the scientific findings. It is not their place to choose these standards. The standards should be chosen by qualified individuals with science degrees and backgrounds.

L.4 should continue to contain the exact vocabulary word to the basic scientific principle of evolution. The language should remain, "The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms." The text should not be altered for clearly and overtly religious purposes

and mythological pretexts. The State of Arizona and the United States of America expressly prohibit the merging of religion and secular education because we are not a Theocracy. Your mythological faith based beliefs have no place in the science class room and belong appropriately in a religious and philosophical inquiry curriculum. The founders of this country intentionally and expressly forbade the deliberate indoctrination in a specific religious ideology and wrote it thusly into the constitution. Leave the language of science and inquiry alone that is solely the way to create a better and more intellectually demanding education.

520. PLEASE return to the concepts that global warming and the "big bang" are established science. You really are destroying the actual use of the term "theory".
- The integration of the scientific practices with the core ideas adds the rigor to these standards in ways that have not been seen in the past in AZ. However, sometimes some of the practices seem to be just added to content statements in ways that seem awkward. For example, why shouldn't students be able to ask questions, plan and conduct investigations, develop and use models, construct explanations, engage in arguments from evidence, use mathematical and computational thinking, and communicate ideas for every standard? This is one of my complaints about 3D learning is that it arbitrarily pairs practices with concepts in artificial ways. Finally, I would say that some of the attempts to create learning progressions fail to really articulate how later standards build in sophistication on earlier standards. Instead, they seem like repeats of the same big ideas. I tried to make note of some of those instances in later comments.
521. Evolution is science, anything less is not teaching our young people what they need to know in a science based world.
522. The rigor seems reasonable for the age levels.
523. Fails to include proven scientific advancements in understanding.
524. Removal/replacement/minimizing evolution is completely unacceptable.
525. I am curious about the phrase "science and engineering practices" as distinct from the "scientific method." Is this change in phrasing reflective of a generally accepted new terminology?
526. I am vehemently opposed to making the proposed changes regarding removing or qualifying the subject of evolution. In no way should this be considered and frankly it makes me consider moving out of this state should this actually occur.
527. Not going into proper depth on the topic of evolution inhibits the potential of Arizona students. When they move on to higher education, they will be with peers who have had significantly different educational experiences. Our students are going to be at a disadvantage and not able to compete on the same playing field. Again, we are failing our students by not giving them a proper science education.
528. Rigor would imply that you are going forward with new curriculum. This is not what is happening
529. The teachers who designed these used appropriate depth and rigor.
530. Require applicable courses to teach evolution and not alternatives to science.
531. Evolution must be taught.
532. Changing the word evolution changes the depth of content. It changes the intended message.
533. Science Standards should only include actual science. There is no scientific basis to support creationism. Creationism is a religious belief.
534. The theory of evolution needs to be taught in school. Colleges expect students understand and be educated on this subject, and so many careers. Deleting the word and using analogies is childish and immature.
535. Religious myths is not science.
536. I disagree with the removal of the word evolution, and the apparent attempt to pander to those who do not understand or approve of it's science.
537. The current draft undermines the clear consensus of science regarding evolution. This is primarily in dispute in churches, which certainly have the freedom and right to do so, but that's where alternative faith-based views should be taught.
538. Depth of rigour will not have vertical curriculum alignment for students going into science areas for college, in area of evolution theory of wording us change to fit religious views and not in partial scientific method.
539. Again, evolution needs to be included in the curriculum. It cannot be ignored and overlooked.
- 540.

541. This is getting to the area that I'm concerned about. I am aware that one of the organizations which this standard was modeled after has rebuked the state of Arizona for insufficient treatment of the theory of evolution. As a relative amateur in terms of development in educational standards, I tend to rely on the judgement of contributing organizations, and this rebuke gives me sufficient concern to question the quality of this content. I have reviewed the pertinent sections of the standard and was surprised at the general lack of depth or detail addressing evolution, so this rebuke appears to have merit in my opinion.

542. I would like to see benchmarks for example: Give examples of differences in animals that would give them an advantage in survival.

As it is currently articulated, standards for several grade levels are inadequate, vague, and/or contradictory.

Science standards 5.L3U1.9, 5.L3U2.10, and 5.L3U3.11 are incompletely described and it is not clear how they are integrated. The current standards are written so that environmental change could be interpreted as a direct driver of the development of adaptive traits in the phenotype or genotype of an organism over a lifetime and passed to offspring. Experience teaching evolutionary concepts in tier 1 general education at the University of Arizona suggests to me that this is a common misconception among Arizona students. A correct and unambiguous conception of evolution is an essential foundation for understanding science standards HS.L3U2.28, HS+B.L3U2.15, HS.L4U2.31, HS.B.L4U1.19, and HS.B.L4U2.20. Life science standards dealing with genetics, natural selection, and evolution should disambiguate the transmission of variability, the relative fitness of traits in a particular environment, and change in the frequency of traits over many generations. The concept described by these standards is more accurately summarized here. The chances of survival and reproduction (fitness) of organisms with different traits determines the frequency of traits in a population (natural selection). Variability in traits on which natural selection acts arise randomly in individuals and are genetically determined. Natural selection on variation results in the adaptation of populations to an environment and evolutionary change over many generations.

Standard 7.E1U3.6 is extremely vague. The phrase "explore Earth" is ambiguous. This could mean anything from seafaring to mineral prospecting to the remote sensing of Earth's surface. There is no direction or explanation for why observing and predicting weather is included in this portion of the science standard, which seems to focus on reconstructing Earth surface processes over long time periods. Perhaps move the weather concept to sixth grade where it better articulates with 6.P1U1.1.

543.

Standard 8.E1U4.8 is vague and contradicts earlier standards. I interpret the "geosphere" to mean the solid and molten mineral component of the earth. It is unclear why the human use of finite resources is of relevance to the Earth's geosphere. The consumption of finite resources is of much greater importance to the Earth's biosphere, which as currently alluded to in earlier grade-level science standards, are directly impacted by human competition for space and nutrients (finite resources). I suggest that this standard be revised in order to integrate the concept of competition with natural selection (standard 8.L4U2.11) with the ideas about fossil succession (standard 8.E1U1.6). This knowledge is essential for informing standard HS.E.E1U1.11.

Atmospheric composition is absent from the listed mechanisms of Earth's energy balance for standards HS.E1U1.11, HS.E1U2.13, HS.E1U2.12 and those subsidiary standards found in columns to the right. This is essential background and should be reviewed to found knowledge regarding standards HS+E.E1U2.3, HS+E.E1U1.4, HS+E.E1U1.4.15.

Questions raised in standard HS+E.E1U4.13 are routinely addressed by inquiry in the fields of humanities and social sciences. Issues raised by standard HS+E.E1U4.14 are negotiated in societies between parties with socially and economically informed costs and benefits. The link between these issues and general knowledge about earth and physical sciences is important, but one does not substitute for the other. I suggest that the note in standard HS.E1U4.14 be heeded, but in a way which expands the social implications beyond supply and demand.

544. Once again, the life science standards for K-2 are lacking. They are not aligned with the latest version of the Arizona State Science Standards or the Next Generation standards.

545. The addition of the science practices and cross-cutting concepts is what excites me most about these standards. It is the right move for our students and the future of our state.

546. Science standards need to be developed and reviewed by scientists, the people with knowledge and expertise in the fields that the standards focus on.

547. More depth is necessary in the following content areas:  
chemistry  
physics

biology  
geology  
astronomy

548. Content knowledge of geology, chemistry, physics, biology and engineering are not requiring a depth of knowledge and are too surface level.
549. The standards need chemistry, physics, biology, earth science, and astronomy.
550. The plus standard separation is a nice touch for those classes that deal specifically with that content.
551. Again you do not have to agree with the concepts. They need to be understand. For a real future in science you have to understand.
552. Needs clearer language
553. Not possible to implement
554. To treat evolution as just one possibility for the explanation of species is ignoring mounds of scientific evidence that shows natural selection and evolution to be true and valid scientific facts. Changing wording to "the processes by which a species may change over time in response to environmental conditions," avoids using the word EVOLUTION, which was present in previous standards. As a former public school science teacher in Tucson, I am shocked at this benighted approach of denying EVOLUTION and promoting the possibility of CREATIONISM and religion in our schools.
555. Depth is fine, rigor has been reduced.
556. Might be harder for beginning teachers to avoid using the Key Concepts as a checklist.
557. I am greatly disturbed at the attempt to remove evolution from science curriculum. This simple concept is not only the cornerstone of modern biological science, but is indispensable for the growing scientific fields of microbiology and genetic research.
558. Your standard that includes walking back about Evolution does a disservice to the education of our kids. Push to becoming cutting edge on education.
559. Students seeking careers in science and engineering will not be prepared to continue their education if they have not learned about evolution, a fundamental part of biology, climate change, probably the biggest problem facing our society, or the origin of the universe, a fundamental part of physics/astronomy.
560. The internal review has created too much depth. For example, HS+C.P1U3.2, contains relativistic energy. That is way too much depth.
561. Terrible. These standards are watered down and gloss over topics that the apparently found to be at odds with their belief system. I want the State to adopt the national science standards - Next Generation Science Standards (NGSS) - that were created by STEM professionals.
562. The standards are rigorous.
563. The key concepts included as part of the internal review add some concepts that exceed developmentally appropriate depth of content.
564. I have specific misgivings about the way biological evolution is handled within these standards. I have more comments on this in fields 15 and 17.
565. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
566. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
567. The edits made by the Superintendent do not reflect current scientific thinking, scientific practices, or rigor of theory or evidence for theory. They are especially egregious in denying the science of climate change, biological evolution, and human impact on natural resources (and yes, this is science).
568. Recent changes made by the ADE open the Standards to the potential for dilution and omission of content deemed essential by experts in education and STEM Fields.
569. Too much detail, as stated above.
570. There are real issues with the rigor of the content. There are scientific mistakes in the standards: magnetic current is something that does not exist. Additionally, watering down content related to evolution serves to make the standards weak and not in line with current scientific understandings.
571. The draft standards seem to have depth of content and rigor, but with very limited verbiage, it is hard

- to tell.
572. From a set of standards it is nearly impossible to know what the "depth of content" or "rigor" in actual classroom presentations would be. These Standards appear to encourage a useful and educational depth and rigor.
573. I strongly disagree with the attempt to eliminate references to evolution that is a foundational and necessary concept in the sciences.
574. These standards seem to cherry pick standards and give diluted examples, while also giving very limited guidance and explanation of how to understand and implement science and engineering practices, or 3-dimensional learning. The way that these are structured, students will end up with random experiences that touch on ideas, practices, and concepts once every few years, and will thus have an incomplete and inadequate ability to understand or engage in scientific reading, practices, and discussions.
575. When you write natural selection and climate change out of the standard or water it down (8.L4U2.12), you do not have the depth of content required to understand current scientific thought. All of biology is based on natural selection!
576. Changing the standard from teaching about evolution to teaching about "the theory of evolution" is watering down the education of our K-12 students and leaving them less prepared for careers, success, and leadership roles in STEM fields.
577. However, they have been changed so that they intentionally strive to MISLEAD and do not represent TRUE science.
578. Seems good.
579. The rigor of this material is more in the hands of the educators than these standards. I wish I received a more rigorous scientific education from the private high school I attended. Each scientific subject matter had an exceptional teacher and one teacher that was apathetic. I got the latter. Since then, my alma mater has significantly expanded and strengthened its science program and they are better school for it.
580. Diane Douglas claims to have made editions that increase rigor, and yet she's eliminated science principles based on DATA and EVIDENCE just to fulfill her own personal opinions.
581. Rigor means scientific evidence, ie: evolution's established fossil evidence.
582. Original language should remain
583. They have appropriate depth of content and rigor.
584. Have those in the sciences decide what should be taught as science.
585. They omit evolution.
586. Again, see my comments to 11. Some subjects are covered at the college level, even for the essential level category. Other subjects (climate change, evolution), are ignored or papered over. Some sections were clearly written by someone with comprehensive knowledge of the subject, others contain very elementary errors (eliminating "phase change" - the correct term and replacing with "transformations", reference to magnetic currents, reference to Newton's laws of motion"
587. The removal of the term "evolution" from the DRAFT submitted by the qualified educators makes the DRAFT Science Standards less rigorous by removing the vernacular used by higher education institutions.
588. (See 11.)
589. Teach evolution. Evolution is science.
590. How can there be any 'depth' if someone's religion is taught in school?
591. Ensure children are challenged and understand science, as in what does a scientist mean when something is called a theory.
592. It is good to see the new changes so Evolution can be taught as a THEORY and not a law.
593. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
594. Religion has NO PLACE in these standards. Any attempt to compromise well established scientific facts with religious fable-based "theories" is unacceptable.



595. Absolutely not. Do not teach creationism this is in-American. Additionally, it is not in the interest of students to be taught things like "electrons are particles" and "gravity pulls from the center of earth", please see einsteins gravitational theory. These scientific discoveries in quantum physics were largely made over a century ago, and yet they remain invisible on a high school syllabus. Please do not teach children incorrect theories only to have them find out in college that their scientific foreground was severely lacking. Young people can understand basic concepts of quantum physics, especially high school students.
596. It's clearly evolution, not "changes over time." The standards should clearly state that.
597. As long as Intelligent Design is included, I'm opposed to the acceptance of the draft.
598. I like the specificity of the standards--the former document contained standards that were extremely vague and too broad.
599. same as above
600. The standards have omitted mention off evolution, a core tenant of science. This is unconscionable.
601. Evolution has been replaced by the theory of evolution in lower grades and stricken from high school standards; Big Bang has been removed. These are not theories, they are science and no curriculum can call itself rigorous without them.
602. Again...evolution is a proven scientific concept...not a theory...and should be clearly stated in all scientific curriculum
603. Evolution is downplayed against all valid scientific judgment. This is allowing some religion to assert itself against science to the detriment of our children's education.
604. Standards 8.L4U2.11 and 12 avoid the use of the term "evolution," and use less scientifically appropriate language. Standard HS.E.2U2.17 has changed the proposed language of "Big Bang theory" which is accepted by the scientific community. Standard HS.L4U2.31 has eliminated the word "evolution," once again consigning students to language that is not used in the scientific community. There is no argument among scientists about the validity of the Big Bang as an explanation for the creation of the universe or the role that evolution has played in resulting biological diversity. Avoiding this language does not provide the kind of solid understanding of science that our students deserve.
605. The depth of content and rigor <was> excellent until last-minute changes were made to water down the language about evolution and the Big Bang theory.
606. Not only should evolution be taught, a a widely accepted theory, it should be taught in depth to promote serious thought and discussion.
607. The standards in this draft do not reflect rigor
608. Only SCIENCE in Science class!
609. Adequate
610. As above
611. The depth of content in the Life Science (Strand 4) component is good, but its rigor is too limited. My concern is the phrase "Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics." This phrase needs an affirmative rejection of non-testable suppositions such as intelligent design.
612. Children need to be taught science in a factual fashion, including full discussion of evolutionary development. Please do not substitute religious brainwashing for scientific fact.
613. See above
614. It is vital that students are allowed the opportunity to learn current and correct scientific information, including evolution and the effects of fossil fuels on climate change.
615. Those writing these standards should be experts in science and/or education.

At a minimum they should understand what the word "THEORY" means in scientific terms.



- Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established scientific theory"
616. Please include Evolution and Natural Selection as the secular fundamental content for the Science Standards.
617. Students cannot compete on the world stage without in depth knowledge of ALL aspects of science
618. See 12.
619. Revisions related to evolutions and related topics are unnecessary, apparently political, and detrimental to the overall quality of education in Arizona.
620. I disagree with it.
621. See comments to 9 and 10. The late Dr. Stephen J. Gould, the evolutionary biologist, had the right idea: He refused to debate creationists or appear on the same platform with them, because it would have given them a credibility they did not deserve.
622. The content is way too broad.
623. Content is fatally flawed and based upon untruths carried throughout.
624. They have no depth or rigor. They are an embarrassment to the state and an insult to professional scientists -- indeed, to all intelligent people.
625. Again, written by professional science educators.
626. Creationism has NO place in a science classroom. There is 0 evidence.
627. Standards that do not appropriately prepare our students to understand and employ the basic processes and mechanisms of evolution will prevent them from being competitive in the workplace and will reduce their future employment opportunities. Additionally, competitive companies seeking to locate jobs in Arizona pay close attention to the science preparation of our schools in order to assess their future workforces. Substandard science standards such as these will reduce the economic competitiveness and economic prosperity/growth of the state.
628. There is a serious lack of depth on the subjects pertaining to geology and biology
629. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
630. Evolution must be thoroughly and accurately taught as it is understood by the scientific community.
- Need to revise draft standards back to version that included teaching at appropriate age levels information on biological phenomena related to genetics, inheritance of traits, adaptation and natural selection and their role in evolution.
631. Also strongly disagree with suggested addition throughout the text of the words (or similar words) "formerly known as the scientific method."
631. What are described in standards as science and engineering practices are much broader than the scientific method which is more narrowly limited to the observation and description of phenomena; use of hypotheses to explain phenomena, make predictions and quantify new observations; and use of properly performed and independent experimental tests of the predictions. These practices within the scientific method are not replaced by the described science and engineering practices, but rather are an essential methodology utilized within that process.
- The standards, before editing, had depth and rigor. During the editing process key concepts were watered down in such a way to muddle basic understanding of science. For example:  
"The unity and diversity of organisms, living and extinct, is the result of evolution." was changed to  
"The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms."
632. Science works by generating ideas based on the available data: Data->Idea. The original statement makes this clear. Pseudoscience happens when people generate an idea independent of data and then choose what data they want to apply their data to, as the edited statement erroneously suggests is the case for evolution. The original statement is true and clear, while the edited statement is muddled and misrepresents reality.
633. Where is the evolution requirement for the high school student that does not take the biology plus?
634. Please send it back to be reviewed

635. I prefer the Next Generation Science Standards for how engineering is made a part of science. Also what about computer science?
636. The depth of content is misguided based on religious and unproven beliefs.
637. Removing teaching on evolution is moving away from academic rigor.  
The evolutionary biology curriculum has been watered down in a targeted fashion, by removing the term evolution or by providing awkward circumlocutions about it. There is no scientific justification for this. Evolution is a sound scientific theory backed up with an increasing amount of evidence as the
638. years go by. Most recently, our better understanding of the various animal genomes and the dating and analysis of fossils and ancient remains further demonstrate the evolutionary connection between species. There is no alternative to evolutionary biology as an explanation for the diversity of life forms that is consistent with the scientific evidence.
639. Evolution should be present in the standards. There should be more depth of content. It is too vague and many teachers will not go into the depth that we should to produce college ready students.
640. Rigor is difficult to evaluate due to lack of specificity in language describing how standards are to be taught.  
I do not have a copy of what I said yesterday, so here are my comments.
641. There are serious issues with the depth of content and rigor. There are serious issues with the watering down or complete removal of topics such as the Big Bang Theory, Evolution, and Climate Change.
642. Evolution is not a dirty word (p. 69). These standards appear to be afraid of it.  
I do support other references to the theory of evolution that are mentioned.  
Perhaps the board needs to evaluate what exactly constitutes a scientific theory.
643. A scientific theory is an explanation of an aspect of the natural world that can be repeatedly tested, in accordance with the scientific method, using a predefined protocol of observation and experiment. Established scientific theories have withstood rigorous scrutiny and embody scientific knowledge.
644. Need more specifics  
There is a pronounced lack of depth of coverage of evolutionary biology and its foundational nature. Further, the intentional removal of the word evolution is tantamount to sabotaging the educational
645. process. Connections which should be strengthened are nefariously and intentionally weakened. Review and changes to life science standards should be limited to those with expertise in the life sciences. Earning a degree in education does not qualify one to review all educational content.
646. Most of these sections show a good depth of content and rigor.
647. Evolution is not just a theory, it is well established fact by science.  
Without the ADE changes, I would have marked this strongly agree. I like that the breadth was limited so students could learn concepts (not content) deeply. ADE additions shifted the focus back to
648. mile wide inch deep, with an excessive breadth of content that will distract from the depth of the concepts.
649. Content and breath of scientific knowledge is diminished in the proposed standards.
650. I would like to see the standardized assessments you intend to pair with these standards before I comment further on breadth of content or depth of content and rigor.
651. Same criticism as # 11.
652. Seriously teach evolution
653. The standards all build on one another as one progresses up the grade level, allowing students to expand their knowledge base as they get older. This allows for increased depth of content and rigor.
654. Removing evolution and introducing "Intelligent Design/Creationism" is wildly detrimental the the education of children. This is an abuse of power and completely unethical.  
It's factually incorrect to claim evolution is not a proven science. Please do not commit the future
655. students of Arizona to false science education. Evolution is a proven science and should be taught as such.  
Both the depth and rigor are shallow and grade inappropriate. The implementation and practice these "standards" will require will result in more misunderstanding of critical science concepts rather than
656. less. The result will be precious time lost correcting what students mis-learned using the prescribed methodology.
657. The changes made in the concepts of evolution are absolutely unacceptable. Re-wordings of the

evolution concepts and standards have made significant and inappropriate changes to the intent of those standards, the meanings, and the factual substance of science.

658. There is a constitutional separation of church and state.

659. Changing over verbiage about evolution and natural selection suggests change and speciation without a mechanism. This is very confusing for students. The mechanism is known. It is evolution by natural selection. This is the driving force behind all the rest of biology.

660. With addition of intelligent creationism the depth of evolution and other areas is diminished.

661. Not real science

662. I would like to see more depth in certain areas that are more complex, especially in the HS standards. For example, HS+B.L2U2.8 is a great start, but personally because it is a more complex topic, it should be taught with greater depth.

663. Very wrong not to teach proven Science...

664. The removal of the word 'evolution' is asinine.

665. Lessening the significance of evolution in the standards by removing the word or using qualifying language is the opposite of "depth of content and rigor."

666. Evolution is established science and should be taught as such. Biblical creation is a faith-based story, not science. For the sake of our future, it is imperative that evolution be taught in an in-depth and scientifically accurate way.

667. not enough rigor should follow NGSS

668. By removing the term "evolution", the evolutionary biology curriculum has been significantly watered down, with no scientific justification. There is no other explanation for the diversity of life forms found on our planet that is consistent with scientific evidence. Evolution is a sound scientific theory which is backed up with a large body of evidence.

669. Please teach evolution and not creationism

670. Watering down lessons on evolution will not help our students meet their long term academic goals. Don't put our kids at a disadvantage immediately out of high school.

671. Please continue advanced rigor.

Wording changes to standards with respect to evolution, a SCIENTIFIC concept and term, have drastically changed intent and meaning of those standards, rendering them inaccurate and false. This is NOT the place to insert alternative religious dogma or biblical theories.

672. Similarly, the Big bang Theory is a scientific theory that is universally accepted in the scientific community. Diminishing this theory to slyly promote Biblical theory is ethically wrong and probably illegal. These are PUBLIC SCHOOL standards. Kindly leave the religious inferences to Sunday school teachings.

673. See answer above

674. The standards potentially offer sufficient depth and rigor but the addition of the key concepts column distracts from the power of the standards as active and participatory.

675. There is no guidance as to how highly politicized topics will be taught. There is no need for creationism to be taught in science. It leaves much room for religious and lobbied interests to enter classrooms and impact the next generation for our folly. It is shameful. Stick to educational basics and elevate our students with a taste of the exciting world of discovery that will soon be theirs.

676. Teach Science

677. As a high school science teacher, both public and private, I focused on the high school portion of the Science Standards. The depth of content and rigor seemed sufficient to me.

678. There's ample exploration of climatology, physics, and astronomy, but inadequate coverage of biology. You know which part of biology I'm referring to.

679. The teaching of "Creationism" or any content alluding to "Creationism" has no place in any educational setting other than an overtly and specifically religious setting which is group specific.

680. As a parent & a Christian pastor, I strongly oppose Superintendent Douglas' proposed alterations to the rational & scientifically sound standards for AZ science students. This is just another covert effort to impose conservative Christian misinterpretations of scripture onto my children. Bad theology makes for even worse science.

681. Year by year framework details depth and cross discipline connections
682. Please exclude any teaching of creationism from the standards -- this is an abomination of all things science.
683. N/A
684. Please see my comments for Number 11.
685. The current (2004) standards are fine. The proposed changes regarding the removal of "evolution" and "Big Bang Theory" are an affront to intelligent, educated people and these changes have no place in the Arizona State Science Standards!!
686. I feel that students will be making connections with other systems and how they all work together. It sounds like models and modeling will be a large part of the content. This will mean that students will be interpreting what they are learning which will give them an opportunity to better understand concepts rather than memorize vocabulary and their meanings.
687. It is inappropriate to push religious theories in the setting of science. It is important to not let personal beliefs of non-scientists force science teachers to teach lies.
688. The replacement of the word evolution effects the depth of content and rigor.
689. The depth of content of the current standards (not the new proposed standards) are good.
690. I feel that the content, especially, when it is dealing with evolution and natural selection and the breadth of scientific evidence supporting these concepts has been watered down to the point where it undermines scientific method and a students ability to critically think in these areas and all related areas
691. See above.
692. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
693. I think that there is depth of content and rigor, it is just hard to follow what that really is due to the formatting. Also, why are we having "essentials" and then "plus." Many of the things in the "plus" category are very essential to learning and should not be categorized separately.
694. "Evolution" can be used in at least 3 ways which should be distinguished. Variations within a species or genus is a well established and observed form of evolution. Darwinian evolution (based on Lamarck) has been discredited. Neo-Darwinian Evolution (NDE) is the current and widely accepted theory of the development of the numerous life forms from much simpler forms. The 3 uses of the term should be distinguished.
695. Let's keep religion out of the classroom, Science is fact based.
696. Scientific thinking, not religious dogma, needs to be taught.
697. "Evolution" can be used in at least 3 ways which should be distinguished. Variations within a species or genus is a well established and observed form of evolution. Darwinian evolution (based on Lamarck) has been discredited. Neo-Darwinian Evolution (NDE) is the current and widely accepted theory of the development of the numerous life forms from much simpler forms. The 3 uses of the term should be distinguished.
698. In addition, students exposed to the empirical evidence that supports NDE such as current genetic discoveries that support common descent as well as evidence that is more problematic such as the fossil record and the probabilities involved. Also, the limitations of NDE should be made explicit -- e.g. that NDE assumes the existence of life but does not explain the origin of life.
699. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
700. The content is being well updated and keeping pace with the rigor of current scientific shifts.
701. The exclusion of facts and inclusion of religious opinion into our state standards limits the depth of content significantly.
702. Not only does evolution and selection prove itself in the biological sciences, but it is now a standard technique in Engineering, Computer Science, etc. Try using a genetic algorithm to build an airplane wing and then try out a GOD-based algorithm:) Which do you think will prevail?
703. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on

science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.

703. There seems to be little content for something like explaining the big bang theory. as an example. Were I to be writing these standards I would explain why intelligent design, if mentioned at all, is a theory, and evolution is a scientific fact. I would also explain how compatible some of the theories are compatible with the scientific fact of evolution.
704. See above
705. Theology DOES NOT belong in the curriculum. This advances extremist right wing views. Leave fact based science alone.
706. Please do NOT make changes that remove or downplay references to evolution and the big bang made by Diane Douglas. These changes, made to support a religious agenda by a person who is on the record as supporting "intelligent design" (which is about as scientific as believing that Mickey Mouse controls the weather) would do our students a great disservice by removing or mumbling through references to genuine scientific principles and theories. Because they are supported by rigorous scientific research, data and real-world observation, evolution and the big bang are scientific theories. The "intelligent design" driven Ms. Douglas supports is based on religious beliefs and have no place in public education.
707. See comments above.
708. this is a not-even-veiled attempt to teach religion and provoke doubt of science.
709. Only when developed by Science educators for each grade level
710. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
711. Evolution has been scientifically proven, so it should be clearly presented.
712. See comments above.
713. I am concerned with the lack of explanation in the curriculum among various scientific terms and how these definitions differ from their everyday use. For example, this updated draft often refers to "the theory of evolution". While this is true, the word theory in science does not compare to the word used in every day language. As defined by the National Center for Scientific Education, a scientific theory is "a well-substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and tested hypotheses." And extremely important part of this definition is "tested hypotheses". This means that a scientific theory has undergone the rigors of multiple scientific experiments and has not been able to be proven false. The word theory, unlike in every day language, is not used lightly in science. In every day language, we may disagree with the statement another individual makes and say "that is just a theory". However, this use of the word theory in no way compares to the use of this term in science. It is essential that public schools in Arizona explain various scientific terms to students and also highlight how these terms differ from their every day use. I request that the definition of law, hypothesis, fact, and theory be taught to students so they can fully understand how scientific terms are used. <https://ncse.com/library-resource/definitions-fact-theory-law-scientific-work>
714. Removing references to established science for an official's personal agenda is a tragedy and will put our students behind the curve in their learning and create a competitive disadvantage that will be difficult for them to overcome.
715. Reducing the status of evolution and the Big Bang will handicap our kid's education. My daughter is a product of Phoenix public schools. Her education was well grounded in evolution. She is now a tenure track associate professor of anthropology at a major university who specializes in hominid paleoanthropology. All along the way to her job she had to compete with thousands nationwide for academic placements, scholarships, grant funding, etc. Had she gone into any of those many science based interviews espousing the prattle that the Superintendent is seeking to have replace evolution, my daughter would probably still be looking for some diminished placement. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
716. See previous comment. Faith does not pass rigor standards.
717. See comments above
718. If you're afraid to use the word evolution, your content is not going deep enough into the observable



- changes on our planet. It's completely misleading and would prevent students from understanding the first and biggest strides in the field (Darwin). There is always more to learn and individuals may understand these things from different religious frameworks, but eliminating the root of all understanding is a huge mistake. I am 100% against it.
719. The present standards are sufficient without teaching anything about religious concepts which should be kept private just as our Constitution states the Separation of State and Religion!  
We need to do better as a nation and MUCH better as a state. Our students get to college unprepared
720. to succeed in science and engineering. These standards are a good foundation (or were prior to watering down the biology sections). I'd like to see more depth and rigor.
721. Many key terms and subject are poorly organized and defined
722. Substituting "biological diversity" for "evolution" in the study of biology diminishes both concepts. They are not synonyms.
723. Plenty of depth, in the wrong direction; rigor about science softened.
724. Removal of scientific fact from educational standards does not produce greater content or rigor. It encourages a future citizenship of 'sheep' to follow their religious master(s).  
The depth of content is vague and undefined. The standards are very general and leave teachers to
725. interpret on a case-by-case basis for each objective. The rigor is relatively high for 6th grade. Many of the new standards are moved down from 8th grade.  
This is too much to teach in one school year. The level of our learners (overall) is way lower than
726. these standards can support. The only way we could properly teach this entire set of standards in one year is to extend the school year. Students will not remember the supporting standards for periodic table and the structure of an atom before we have to teach chemical bonding in 8th grade.  
I think the rigor may be too much for seventh grade. The math for motion and speed calculations as well as the graphing will be too complicated for them. Eighth graders have a hard enough time doing the calculations and graphing.
727. Doing Bohr models in sixth grade will be difficult as well. It is also important to note that many elementary schools do not cover the minimum amount of minutes for science and students will not come in with the prior knowledge needed to be successful at the grade level standard.
728. The standards are very broad and don't really give us an idea of how far in depth we should be going and the depth of knowledge that students should be reaching.  
I believe the some of the grade levels are receiving concepts that are far beyond what our students
729. are capable of learning. A 6th or 5th grader is not going to be able to acceptably learn the basics of a periodic table.  
The standards are written too vaguely to understand what the depth of content needs to be. Too
730. many educators differ on the definition of rigor. It has strong possibilities for rigor, but others could interpret it differently. There will need to be much professional development.
731. We're sacrificing depth for breadth.
732. I don't believe one can truly comment on rigor until it's been implemented in a classroom.
733. (see below regarding content)
734. Without having students take four science classes in the state of Arizona, and having the AZ Science test during the Jr. year, the curriculum board has put teachers in a difficult situation and the learning process in jeopardy. We are currently going through our curriculum to figure out how to fit ALL science essential standards into a 3-course configuration. Especially with the 3D switch in teaching and learning, it will take FAR MORE time to move through material. This plus increased science standards in every course creates a real problem in adequate education of students in science in Arizona. We need FEWER essential standards and MORE time in class to use 3D teaching/learning practices. We can't squeeze everything in!
735. The depth of content/rigor might be ok IF we could expand out the number of classes in which it is taught.
736. The picture representations of the depth of content and rigor are nice to see and would be of use to those new to the field of education.
737. Some of the plus standards will be very difficult to teach to students who struggle with basic math concepts.
738. Some grade levels seem to have more rigorous standards than others.
739. See above



740. What is rigor when the standards themselves deny one of the basic premises of science -- evolution.
741. The proposed standards are slanted one way.
742. Referring to evolution as only a "theory" when the vast majority of all biological standards we know and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined.
743. Evolution must be included as it is a tested scientific fact.
744. You should be teaching CREATIONISM, which is the truth. You should at least be teaching them side by side if you are going to include the ridiculous evolution. Teaching is supposed to present BOTH sides and let students decide for themselves; not BRAINWASH students into believing like you do!
745. Same as above.
746. You need to explain and teach FACTUAL science, which includes evolution!
747. See above
748. Changes to the standards content as reported in the media suggest that they reflect an erosion of depth of content and a diminution of rigor by failing to acknowledge the long-established status of evolutionary theory and by casting doubt on the rigor of the theoretical basis of evolutionary science.
749. see below
750. seems age appropriate
751. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK! You do a great dis-service to our state's students and their future abilities to function and compete in the world. Now, more than ever, we need rigorous and exceptional educational standards to ensure the future for this nation and our posterity. We need to explore the gamut of leading peer reviewed, replicable scientific research to survive, thrive, compete and excel. How can we accomplish those goals with these namby-pamby, watered-down, dumbed-down curriculum changes you are proposing? Where will the future doctors, nurses, professors and scientific researchers come from? Evolution is a complex issue and we are constantly learning more about it - from longer, more gradual adaptations to brief bursts of rapid adaptation. Both are valid and important to understand. Why are you so afraid to use the correct scientific terms?
752. See above
753. Depth infers understanding. In order to understand evolution, you need to understand natural selection. In order to understand natural selection, you need to understand evolution. These are proven facts. Religious beliefs do not belong in a science curriculum.
754. Standards that include religious doctrine and exclude long-accepted science are not appropriate in PUBLIC schools.
755. Calling out specific scientifically justified standards for change over time (evolution) should be used to target a standard. Students should be prepared for further education which this baseline in scientific principle is used.
756. The suggested content changes which replace references to evolution will limit student's scientific exploration.
757. Theory of intelligent design does not belong in the science category. If you want to have it taught, put it in philosophy, history (especially to show how many human lives have been lost to religion) or humanities. Science is not the correct placement for this topic.
758. Any attempt at associating a religion that has NO CONSENSUS in the scientific community with the truth of evolution does a disservice to our students and our country.
759. Needs to retain references to evolution
760. Regarding the Key Concepts: Too much like the vocabulary from the outdated standards from 2004!
761. Again, do not change the current depth of content.
762. no comment
763. Overall content is good, except for the attempt to dumb down the standards and remove the references to evolution

- Academic science standards must be both comprehensive and dynamic. Any standard must be flexible
764. in order to adapt accepted (peer reviewed) changes in our understanding of the universe and evolution as accepted scientific fact.
765. Not as Douglas would have them read. Let the science professionals write and approve the standards including "intelligent design" into a modern science program committed to using principals and methodologies specific to the specific discipline of modern sciences is distorting student understanding of what is considered as legitimate scientific theory, what it means, and how it operates. For instance, a "theory on the best pizza recipe" is legitimate, but subjective and unverifiable and is not answerable to the same rigorous and specific standards/criteria as is the 500
766. year-old specific methodology developed in modern science using sense data, reason, and mathematical computation. Yes, it is imperative that we encourage young people to think critically on all subjects, but embedding a subject like "intelligent design" into a science curriculum would be mixing apples & oranges. The discussion would serve students better if put into another department's curriculum.
767. The author appears to be attempting to reduce or eliminate depth of content and rigor to allow for non-scientific ideas.
768. evolution and environment have roles that have the potential to making life on this earth better. There should be more stress on these, not less.
769. It will not contain evolution if your revisions go through... so it is not in depth either.
770. KEEP the word EVOLUTION in the standards. Evolution is accepted science . There are NO alternative theories that are not religiously based.
771. By removing any part of evolution from the science standards is only telling part of the facts. All FACTS should be taught and other theories discussed.
- It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
772. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
- Overall the rigor seems appropriate, but I would like to see more hands-on learning. This applied
773. learning is what sticks with kids and often makes science seem fun and cool enough to pursue long term. It helps them to add meaning to the terms they are learning in lessons and make connections with the natural world.
- There is nothing significant about the Science Standards that need or require a change. The depth
774. and content of this curriculum does not need a change in wording that may significantly change the way real science is currently being and has been taught for decades.
- Several important items have been removed from the standard including details on the theory of evolution and natural selection, the big bang theory, and the interactions between climate, the sun,
775. and species survival. These should not be omitted. Note that scientific notation is mentioned only once in the entire document but is an extremely important part of educated students about science quantitatively.
- Evolution, DNA, and related field of biotechnology require detailed understanding of these concepts to
776. live and understand basics of choosing food, proving crimes, protecting our world. RECOGNIZE and INCREASE the discussion of evolutionary concepts.
777. Evolution and the big bang theory are based on real science. Intelligent design is not. The latter is a religious belief and has no place in public school system.
- What a joke! Unless the kids of AZ have an opportunity to learn the full and true impact and
778. importance of evolution and exactly how it works, they will be seriously short-changed in all aspects of life.
779. Depth is always an issue but high school courses are intended to be introductory and must include a variety of content.
780. Teaching nonsense isn't very rigorous.
781. It can't be rigorous if it covers religious views instead of scientific views.
782. evolution must be included
783. DO NOT WATER DOWN THE BIG BANG AND EVOLUTION. These are "theories" in the way that gravity is a theory and the combustion of gasoline is explained by a theory. De-emphasizing them will raise a generation of Arizonans needlessly skeptical of established science. Skepticism is important in the scientific process, but not worth emphasizing for established laws of nature like how the Earth

revolves around the sun, that  $2+2=4$ , that the universe is expanding in every direction, or that there is an unbroken thread connecting species form billions of years ago until now.

784. Intelligent design and creationism do not represent rigor.
785. Humans are capable of so much learning. Set higher standards and watch them rise to the challenge.
786. Yes, they do.
- Standards should include instruction on the methodical accumulation of knowledge via the scientific method of enquiry, the importance of data and rational analysis over opinions and beliefs, and the political, social and scientific disarray that occurs when religious or political options become an obstacle to the advancement of knowledge.
787. This is a yes and no response. The column "Key concepts include but are not limited to..." don't clarify or add to the language in the first column. In fact, they contribute to a superficial reading/interpretation that diminished their effectiveness. If their purpose is to facilitate a concept search within the standards then language such as "Concepts taught in 4.E1U2.4 and gravitational forces, orbit around the Sun, oceanic currents, grade level connection: 6.P3U2." (p35) might be helpful. But it seems confusing and unnecessary to me.
788. Does not adequately address evolution and cosmology (Big Bang).
790. The proposed standard change regarding evolution is neither rigorous and furthers neither science nor education.
- The high school "Essential Plus" standards in physical sciences are fine.  
These 3 "essential" standards should be moved to "Essential Plus", since they fit only in physics:
1. HS.P2U1.5 - Construct an explanation for a field's strength and influence on an object (electric, gravitational, magnetic).
  2. HS.P2U3.6 - Investigate and communicate how fields (electric, gravitational, magnetic) are utilized and how they influence the structure and function of different technologies.
  3. HS.P3U3.8 - Analyze mathematically how Newton's laws are used in engineering and technologies to create products to serve human ends.
791. There are far too MANY "Essential" standards, and they are too COMPLEX, thus promoting superficial memorization (and forgetting!). And they are awkward to implement unless students take 4 years of science, in all 4 categories. See my comment #15 for a solution!
- The key concepts greatly limit the development of deep thinking and understanding about the content at each grade level. Using the standard statement should be a starting point for schools/districts to then develop learning progressions & curriculum based on the Framework and other research-based references.
792. The standards are neither deep nor rigorous. Replacing the term "evolution" with "biological diversity" conflates process with outcome. Replacing "evolution" with "change over time" belittles the timescales and changes involved. Both of these are old tactics which have been repeatedly refuted by educational and scientific organizations and denied standing by the judiciary. Arizona students deserve better. They deserve truly deep, rigorous, and \*accurate\* standards.
793. The depth of content and rigor of these standards is compromised by the failure of the standards to acknowledge that the basic building block of science is evolution. Evolution should not be presented as a theory.
794. This really depends on the subject (at the high school level). There is potential for rigor, but some of the wording is confusing.
795. Ignoring evolution leaves students lacking the ability to see all perspectives of biological change and analyze information to come to their own conclusions.
796. KEEP the references regarding Evolution as they were submitted. Science "theory" is not the same as the use of the word by the general population.
797. Evolution and the big bang are well supported scientific theories that must be included and explained in any science education.
798. We need to retain references to and explanation of evolution. Evolution does not deny the existence of God. It is an observable fact. Just look at the bacterial adaptation to antibiotics, which requires us to use stronger and stronger antibiotics. Even the Big Bang required a Higher Power to initiate it. Arizona students deserve to be on an equal footing with students in the rest of the U.S. Evolution is an important factor in our understanding of the world.
799. Removing evolution from curriculum is an extreme political decision rather than a sound educational one. These standards drive the instruction in our public schools where there is a distinct separation of church and state. There is an overwhelming support of the theory of evolution in the scientific
- 800.

community and there is an overwhelming critique of this theory in some religious communities. Such a decision to remove the theory of evolution from curriculum in our public schools is an assertion of religious belief that ultimately is unconstitutional and infringes on the rights of those who do not hold the same religious beliefs. There is no reason why multiple theories cannot be addressed. Creationism fits perfectly in Western Civilization Social Studies courses as it comes from an essential text, The Bible, that greatly influenced the development of the Western Hemisphere. There is no reason both theories cannot be learned together. Learning both theories from these different disciplines helps develop well-rounded, well-educated citizens for our state.

- This refers to the SS prior to changes made by internal review. Changes made gravely diminish depth of content and rigor. For example this change on Page 9 for Kindergarten doesn't make sense: "In this grade level, students will learn how (objects impact one another) light and sound are impacted by senses". Teaching kindergarten students how objects impact one another makes sense, but not how light and sound are impacted by senses, I don't know what that means. How can you impact light and sound with your senses? In general, the internal review edits should be removed as the standards as
801. written prior to those have a much better depth of content and rigor. I also find the changes related to eliminating or changing the references to "evolution" negatively impact the depth of content and rigor and the draft should revert to that as written prior to internal review. Note that there are a few instances where clarity, depth, and rigor have been improved (e.g. the sections highlighting connections to other academic disciplines, changing "gather" to "Obtain, evaluate, and communicate") but these improvements pale in comparison the overall negative impact of the changes made during the internal review.
802. Not sure if the learning progressions will work with the standards.
803. The science standards should be even more rigorous, with access to serious and continuous study and support from the earliest primary grades.
804. The lists of subject areas and content of the teaching is SORELY DEFICIENT. It is a well documented principle of business as well as social-science that: "LOW EXPECTATIONS - LOW YIELDS." We need to expect much more of our children...for their futures.
805. Overall this new curriculum is great work, thanks for all the effort and thanks for listening to my ideas with an open mind.
- Promoting the teaching of this ideology violates basic scientific standards that scientific theories must generally be falsifiable, a basic principle of science first established by the eminent philosopher Karl Popper.
806. Creationism has nothing to do with objective, peer-reviewed science. The theory of evolution is strongly supported by all available evidence and modern biological sciences would not be possible if no founded on that evidence.
- I am in favor of referring to evolution as a theory as well as intelligent design as a competing theory. I grew up with evolution training in public school. I changed my mind several years ago. The
807. difference in my opinion is only ETERNAL LIFE or ETERNAL DEATH, no big deal. Thank you for at least challenging youth to acknowledge there may be something to the theory that God did the work, not nature, and that each child is loved by Him.
808. Elimination of distinction that organism diversity is a result of evolution is unacceptable.
- I always have found this to be left to interpreted per district and how detailed the courses are taught varies from school to school besides even classroom to classroom in one school. Common curriculum
809. is difficult when teachers are individuals and have freedom of what labs like to do and to write their own assessments. this is important for diversity but it'd be nice if teachers had a menu they could be provided with and thus share with their students.
810. Subjects cannot be taught effectively if important concepts are suppressed (see 11)
811. Depth and rigor include not eliminating standards and topics of evolution. We can not remove scientific fact and still have depth and rigor.
812. Religion has no place in the classroom that is why we have a separation of church and state.
813. No evolution? What? Please!
814. This is hard to answer - the teacher will be able to add depth.
815. By using investigations and creating models students can develop a much deeper understanding of the content.
816. None
817. The depth of content and rigor could be a bit stronger. Particularly at the middle school and high

- school levels. Many students are getting a beginner's level of content at the middle school level but at the high school level emphasis should be placed on content knowledge, engineering design, and connections to mathematics. For instance, the life science standards should specify Biology or Biochemistry not just life sciences. Life sciences could include biology, biochemistry, microbiology, human anatomy and physiology. The standards should address these specific areas of life sciences for the high school science teacher and the high school teacher should have the anatomy to take the standards and build off of them for their units of study or course study creations.
818. I like that the scientific method has been restructured, it is much more realistic. The "plus" within the high school standards is much needed!
- The internal review AZ standards on page 69 reads, HS.E2U2.17 Analyze, interpret, and critique \*supporting evidence for the Big Bang theory and the scale of the Universe\*
819. theories related to the scale and expansion of the universe with every word between the asterisk deleted. However, on page 79 it reads, "L4: The theory of evolution seeks to make clear the unity and diversity of organisms, living and extinct, is the result of evolution organisms. The theory of evolution seeks to make clear...is included. Why are you leaving out the theory of evolution on page 62?
820. Does not need any non scientific hypothesis such as creationism
821. N/A
822. See above
823. Lacks any depth or scientific basis!
- The depth of knowledge of these standards are mostly at a DOK-1 or DOK-2. The standards should
824. serve as ceilings of assessment. These are worded more as overall scopes of learning. The standards do not engage students in scientific inquiry or engineering design.
- The standard DID have enough rigor in the form the original experts presented it. Whomever came in
825. after the fact to soften the evolution language and remove climate change references does not belong near our kids' minds.
- Adequately teaching STEM means teaching students about evolution. Removing the word "evolution" from the Science Standards when discussing biology means that the Science Standards would not reflect scientists' understanding of the biological world and therefore would REDUCE the rigor of the standards. Arizona students deserve to learn how scientists understand and explain the natural world.
826. Teaching biology without teaching about evolution would explanation of the natural world -- one that has been rigorously tested by many observations and experiments. Removing the word "evolution" from the Science Standards when discussing biology means that the Science Standards would not represent biological sciences accurately. Arizona students deserve a rigorous science education so they can compete and succeed in the highly competitive world of science.
827. They do if you remove Diane Douglas's finger prints. I mean really. honestly folks, she has basically zero science experience. Do a religious studies course. There she cab talk about her faith.
828. Too many weasel words included that water down accepted scientific theories.
829. They are good the way they are
830. By omitting the references to evolution you are disregarding a major facet of science, which means that children are not receiving a full science education.
- One hundred people qualified to address the state standards deliberated over the course of a year to arrive at the best approach to Arizona kids' science literacy. Then, it seems zealous ideologues came in and trampled all over the results because their friends could buy them the ability to do so. That's unacceptable.
831. there is no depth and rigor in pseudo science.
- Creationism, intelligent design or whatever you want to call it has NO place in the science curriculum. Science standards should ONLY be devised/revised by knowledgeable SCIENTISTS, NOT MS. DOUGLAS, who is showing her ignorance on the subject! There is no place for religious beliefs in public education.
833. See above.
834. See above.
835. They lack depth and rigor because they leave out the most significant, well-proven scientific knowledge available about life on Earth.
836. Again, the key concept column takes away from the original draft which did have more rigor.
837. Our students will be the laughing stock of the country if Diane Douglas has her way.



838. MUCH improved from previous standards! However, the lack of attention to evolution and climate change is a serious omission.
- It is not rigorous science if you put in so many qualifiers that you make a mockery of the authority of what you are teaching [e.g p 40 "...the positive and negative effects..."]. You are simply inviting skepticism which defeats the entire purpose of the lesson. Do you believe what you are teaching or not?
839. Not enough depth or the rigor.
840. I object to any change in language that attempts to undermine evolution as scientific fact.
841. The content is not aligned to the Framework for K-12 Science Education. Standards are isolated bits of content matter.
842. Global warming, evolution, "Big Bang" theory should be included. This document contains reference to evolution. Why is Douglas deleting that?
843. Again, you can't teach science without mentioning evolution which is factual and what science is based upon.
844. Same comments as above. Evolution and Big Bang Theory are science and NEED to be taught by NAME and CONCEPT. Watering things down for a religious assumption or belief is simply not acceptable.
845. Content from religious believers (of ANY denomination) does not apply, and should not be included, in any 'scientific' curriculum. Such content can be included - and with greater depth - elsewhere in the overall scope of classroom education.
846. As per my comments above under #11 - There is no depth, and certainly no rigor, to the Science Standards when the terminology related to evolution, natural selection, and the Big Bang theory have been removed. In point of fact it is abundantly clear that the intent of the revised language as recommended by Ms. Douglas' team's redlining, is to muddy the waters in these areas as much as possible. This shows not only a lack of scientific and academic rigor, but an active, unethical attempt on the part of Ms. Douglas's team to gloss over their attempts to infuse faith-based teaching in our public school curriculum. Please stop trying to manipulate the public to suit your own, narrow, faith-based view of acceptable academic content.
847. NGSS is what we are using. We don't even follow AZ standards.
848. There is no reason that I can find for the Department to amend the submitted draft as presented by the committee. These amendments have only made the discussion more shallow and less rigorous.
849. Much of the content is hands on and rigor is matched to grade levels adequately.
850. Evolution needs to be taught.
851. The notion of "intelligent design" is neither deep nor rigorous. However, learning about the complexities of adaptations is.
852. The changes made by the internal review group greatly changed the standards and reduced the accuracy of the content and the rigor. All of the edits made during the internal review need to be removed. The watering down of the evolution content that resulted from these edits is unacceptable.
853. Also the reference to the Science and engineering Practices as "formally the scientific method" is NOT correct. And Science does not have a "purpose" as stated in U1--Science is a way of thinking about the world and a body of facts--no "purpose." The addition of the Key Concepts column greatly damaged the content and rigor and is more of a vocabulary list than an explanation of concepts. It should be removed.
854. Please see my comments at stated for Section 11. I feel they also apply to depth of content and rigor
855. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
- Clearly the AZ Dept. of Education (ADE) is trying to take rigor OUT of the Science Standards by changing "evolution" to "the theory of evolution".
856. These are Science Standards. Evolution is science.
- Creationism and "Intelligent Design" are stories for Sunday School. These stories don't belong in the AZ Science Standards.
857. As above in #12
858. Discussion of evolution is central to science education



859. Since the Core Ideas of Earth & Space science are minimal, that discipline does not have enough depth of content and rigor. In the Life Sciences discipline, there is not enough depth and rigor of the main unifying theory of biology, namely the theory of biological evolution.
860. Need to keep evolution. All concepts deleted by demented Superintendent need to be replaced.
861. I cannot endorse any curriculum with religious content. Intelligent design and evolution can co exist, but intelligent should be taught at home and left to parents to explain their family's belief system to their children.
862. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
863. My main concern with these standards, as a parent and a scholar, is the changes that were made after the writing committee completed their work (those in green font). These changes that focus on evolution as a theory and that undercut scientific fact have no place in science classrooms. We would be doing Arizona students an enormous disservice by allowing these standards to be approved.
864. The first grade ones especially are very superficial in some ways.
865. There is a lack of specificity about what exactly is to be taught.
866. These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
867. Adopting the NGSS would bring Arizona students in line with the depth of content and rigor experienced in other states and the international science community.
868. Once again, they need to be expanded with the guidance of science educators, not anti-public education, anti-science activists.
869. Also hard to tell from wording. If I see the word "rigor" I tend to immediately shut down. It is a word that has been HIGHLY overused.
870. The content could go into more detail, particularly regarding biological evolution.
871. No religion in our schools, it's unconstitutional
872. No religion in our schools! Unconstitutional!
873. ID is not science. Teach science in schools. Teach religion at church.
874. Teach evolution. Teach "Big Bang."
875. As a fourth grade teacher for over twenty years, I disagree with the rigor. Fourth grade students have more curriculum than any other grade level in k-12. Not only do we have more curriculum to cover, but we are tested more than any other grade k-6. We are spinning our wheels every year trying to cover everthing before the AZ merit test in science. Please take more items off, without adding other items to our curriculum, it is not okay to keep piling everything onto fourth grade. This is not fair for fourth grade teachers or students. Items should be divided more equally among all grade levels. We do not have the time it takes, in our classrooms, to teach all that expected from this revised curriculum.
876. The intent of education should be to provide information in a way that allows children to absorb it feasibly. Ideally, they will be able to apply it in many ways outside of its original context. Science class is the closest most of them will get to a logic or theory class. There is far less 'rigor' involved in the proposed changes, as there is a lesser chance of diving into the 'why' of things-- that's what scientific theory is.
877. This DRAFT should have been designed and vetted by scientists not by Diane Douglas who has no science training.
878. Key concepts column minimizes the content and rigor of the standards, turning the content/practices into a check list of vocabulary terms. Connections to other academic disciplines are often incorrect/misaligned/not at all related
879. **[No Answer Entered]**
880. Same as above!
881. Religious beliefs have no place in science standards. DO NOT remove references to evolution and replace facts with religious terms. We are already falling behind the rest of the world.

882. Evolution should NOT be removed
883. Channel 8 has good programs on evolution if the Arizona Department of Education needs a refresher.
884. If the ideas of the Big Bang Theory and Evolution are deleted, we are no longer providing Arizona's children with current, relevant information. Why would we go backwards in providing a less relevant education to children who will need to compete in a global marketplace for both higher education and jobs?
885. All theories on the origin of life should be taught. Teach the scientific process and then teach them how the evolutionists and the creationists use that process to formulate their theories.
886. Adequate
887. I believe the new standards are missing more depth compared to the older standards especially in Evolution and Changes to the Environment.
888. Some of the standards are ridiculous. The Bio standards that dance around evolution are so ARCHAIC! Do we want to be the butt of jokes around the country?
889. Any science standard that obfuscates the significance of evolution is lacking.
1. P2 U1.1
  1. P2 U2.2
890. Please remove these standards because they are developmentally inappropriate. Evidence from "Working with Big Idea of Science Education" states that students are not ready to learn these concepts in First grade.
- Please remove the first grade standards 1.P2U1.1 and 1.P2U2.2 as there is no clear learning progression and they are developmentally inappropriate. If you look at the document, "Working with Big Ideas of Science Education" you will see this clearly communicated.
891. Put it back the way it was.
- The committee work emphasized the needed connections to the core ideas, crosscutting concepts, and science and engineering practices in order to make sense of the natural world and understand how science and engineering are practiced and experienced as a three-dimensional teaching and learning methodology.
892. There is nothing rigorous in this new language. This is pulling the science from science!
- I would suggest the state re-consider adoption the Next Generation Science Standards, particularly since Arizona contributed to the drafting of them. These standards are highly robust and are the work of many state groups, rather than a "top down" federal standard movement like common core. The standards are rigorous, emphasize investigation and evidence gathering, analysis and presentation, and are accompanied by substantial resources for instruction.
893. In the current Arizona draft standards, of most concern is the avoidance of the term "evolution" in places such as page 43 where text "adaptations contribute to the process of evolution" was stricken. Also in HS+B.L4U2 on page 69 where it should continue to read "mechanisms of biological evolution" rather than its definition without the word "evolution". Also of concern is the overall L4 standard, which has been edited after "internal review" to emphasize the "theory" or evolution. This could lead to misinterpretation by many who might conflate the idea of a scientific theory based on great volumes of evidence (which biological evolution is) compared to the layman "theory" which amounts to an opinion or thought without necessarily having any support of evidence. The standard should be left as it was prior to internal review edits or read something like: "Biological evolution explains the unity and diversity of living and extinct organisms."
894. I think these standards promote depth of knowledge and rigor, but to fit Chemistry, Physics, Earth Science, and Life Science standards all into three years of instruction will be incredibly difficult, especially since all of these courses have their own plus standards that must also be met. 31 Essential standards is great over three years; however, when you add the 64 plus standards, we're looking at 95 standards over three years. The Chemistry (9+ standards) and Physics (13+ standards) plus standards are more concise, but they are very dense. There are about 2x as many plus standards for Earth (22+) & Life (20+).
895. Change the content.
896. The plus standards had a lot more content and rigor than I have seen before. It is interesting to see that and could be an option for advanced courses.
897. The depth and expectations, the timing and sequence will be a large factor of the actual depth of the content achieved.
- 898.
- 899.

900. the depth of the standards does builds on each other.
901. It is appropriate.
902. I think the depth of content and rigor is good....it still just needs to come down to the order and the time frame we have to teach it before a major test, like the CRT's and Science AIMS.
903. I am concerned about the Life Science areas that have replaced concepts related to biological mechanisms of evolution or similar terms with other words.  
It has a deeper DOK Level but it skips a lot of steps. For example in the old standards for Earth Science they had to identify Earth materials and in the new standards they're expected to obtain, evaluate, and communicate information about the properties of Earth materials. If they take out the steps from the old standards they're expecting students to already know this information which means that the parents would have to teach them before they come into school because they're not learning it in school.
- Also, the following standards: 1.L3U2.9, 1.L4U2.10, and 1.L4U4.11 are NOT DEVELOPMENTALLY APPROPRIATE for 1st grade. Standard 9 is basically about teaching students genetics which I didn't learn until high school. Standard 10 is about dividing animals into groups based on the classification of invertebrates and vertebrates. Again, I did not learn this until middle school. Standard 11 is learning about extinction and how humans can effect that. Again, that shouldn't be learned until high school when students can process the material. I'm sorry but whoever thought those three standards would be appropriate for a 6 and 7 year old is crazy! They need to be learning the basics. It's fine to have higher DOK levels but understand what is developmentally appropriate for that grade level. I'm gonna be honest.. if those standards are going to be kept I won't teach them because it's too complex of a concept for 1st graders to know. You can't go from one extreme to the next without some steps along the way. You are setting these kids up for failure with the current draft of science standards.
904. There needs to be more emphasis on the different Science and Engineering Practices outside of just a few words at the beginning of each sentence. Instead of a column about "Key Concepts" that just list of assorted vocab words, it would be more useful to have information and examples on specific Practices.
905. The depth of content rigor is not uniform. The breadth of the content makes it so that we cannot teach it to any sort of depth in the time allotted.
906. I disagree because the standards do not cover space. The rigor does not seem developmentally appropriate for 1st grade students.
907. The depth and rigor are represented accurately. The Key Concepts have a comprehensive list.
908. keep evolution reject intelligent design fire this lying woman
909. Underlying standards which eliminated evolution reflect deficit content and rigor
910. Only qualified science based persons should study this issue.
911. The "depth and rigor" of the changes actually do not depth or rigor for teaching.  
It is hard to gauge the depth, as some of the plus standards are a bit vague, but even with
912. minimalistic interpretations, one would be very hard pressed to attempt to meet all of the standards with the intended depth in a three year sequence.
913. The standards that were released have removed the rigor that was implied by the science working groups. These groups of experienced science professionals intentional wrote the standards to be rigorous, thereby creating critical thinkers. The standards that were released we more PO's designed for students to just fill in a bubble.
914. When I listen to students as they have moved on to college - the depth and rigor of these standards
915. is more aligned to studying and explaining scientific knowledge that is "known" and does not necessarily engage them in the practice of engaging in scientific thinking and exploration.  
Sill feels like the standards are skimming the top and not going deeper. Kids are learning a part each year but the connects may not be made throughout the years. If you want depth don't spread out the different concepts. Make it more a whole year just has one focus like physical or Earth for depth.
916. Rigor is with making models, but what is a good scientific model for the concept and for the one part you are working on for that year? If they remember the last year part or if they were taught science in 6th grade.
917. These standards have improved in that they are incorporating higher level thinking skills vs memorizing vocabulary. There are still a number of topics which means teachers will be just skimming

the surface of each topic/skill.

918. I think that we are still doing what we have been doing currently. We spend so little time on concepts and move on with no student understanding of the concepts. Even though there is spiraling in the standards they only learn a small part each year. I don't feel that the "parts" flow very well. As a teacher they need the depth for a school year.

919. There seems to be too many concepts that are skimmed and not enough depth. It would seem more beneficial to focus on the "Physical, Earth and Space, and Chemical" themes to be separated by grades rather than bits of each at each grade level.

I think that the unedited draft standards had good depth of content and rigor, but there are flaws that were introduced in the editing process that are stating incorrect ideas. Therefore, the depth of content is irrelevant since the content is now flawed. As an example:

1.P4U3.4 originally read (as I read it): Design and evaluate ways to increase or reduce heat from friction between two objects.

920. An edit was made that has it now reading: Design and evaluate solutions to increase or reduce... This is an example of a terrible edit by someone who does not understand science or engineering. You can not have a solution if there is no problem and how can increase AND decrease of heat both be problems. This standard should read:  
Design and evaluate methods for reducing or increasing the heat created by friction between two moving objects.

921. At the same time, standards are both too complicated and too narrow.

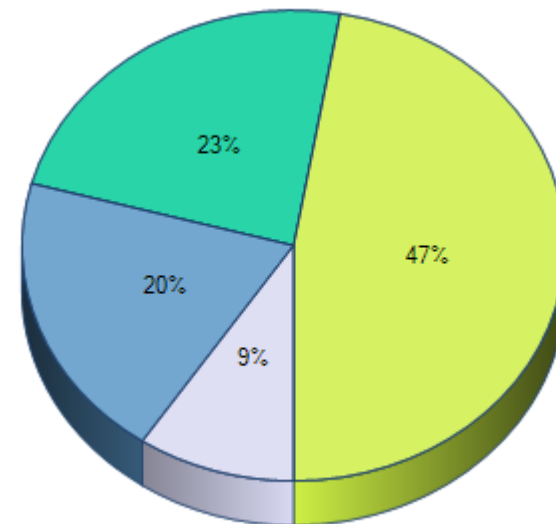
922. See above comment. I'd rather leave comments on breadth and depth of content to educators who are better versed in how the standards are implemented.

923. More detail is needed to support the science areas taught.

924. It should be more detailed.

**Total Respondents 924**

**11.** This DRAFT of the 2018 Science Standards is an improvement compared to Arizona's current standard (2004). You can review Arizona's current Science Standard (2004) [here](#).



	Response Total	Response Percent
Strongly Agree	142	9%
Agree	300	20%
Disagree	355	23%
Strongly Disagree	714	47%
<b>Total Respondents</b>	<b>1511</b>	
<b>(skipped this question)</b>	7326	

**12.** Please comment about this DRAFT of the Science Standards compared to Arizona's current (2004) Science Standards.

1. The working group developed a great draft. The ADE internal review substantially changed the intent. Remove all the Changes that ADE made without the working group knowledge
2. The Science Standards are confusing because they are vague and lack clear objectives
3. Wonderful
4. If it ain't broke, don't fix it.

5. I am confused as to why there is such a shift in standards by grade level. Some concepts that have traditionally been 8th grade concepts are now 6th grade concepts. These seem somewhat arbitrary and will simply lead to more work for teachers who have to make all new lesson plans.
- The new 6th grade standards with regards to small - atoms to large - solar system is unrealistic. The current system of building a solid foundation in the all areas to support 7th and 8th grade works well.
6. To switch .... 1. Space is too abstract for 6th graders. 2. The foundations are not built on in elementary sufficiently. In addition, 7th grade content is lacking. It's like you packed 6th and 8th again and left fluff in 7th. (which happens in both the new and the old)
7. The standards are
- There are a few standards that have moved grade levels. I don't think it is an advantage to add Earth and Space 8.E1U1.6 (ages of rock) this standard should stay with 7th grade where rocks and fossils are taught. You can't teach about fossils and rocks without talking about the age of the earth. Also moving the force and motion/Newton's laws standard from 8th to 7th is a bad idea. When students enroll in high school 9th grade standard Science class is physics and chemistry. We are putting our students at a disadvantage by the lapse in time between 7th and 9th grade. This force and motion standard fits perfectly with the energy standards that 8th will teach. It ties all of the concepts together. transfer of energy can be directly related to forces and motion.
8. The original draft that was sent ( minus all the green added text) was better. Not minutia, factoid, but deep connections.
9. The current standards are hard to read and do not grow on each other throughout the grade levels.
10. I like how it's organized better, and how the concepts are more woven together. More needs to be added about terms like "systems thinking", or other terms that many people might not know.
11. These standards seem to be more specific than the 2004 standards.
12. I like the combined process/content standards. I just find the elementary standards and their time demands to be too
13. Much. I think the key concepts need to be removed or simplified
- Including the cross cutting concepts, the core ideas and the science and engineering practices are a BIG part of the positives for the changes to the standards. The concern again is that the standards should NOT be prescriptive and force a method of implementation rather give a foundation for the what to teach but never the how, that is the craft of the teacher and the tool that is used in the curriculum chosen to implement the standards.
14. Yes it is... with all the "actual science" taken out. Age out problem.. let's have the students "problem solve" but give them no true knowledge of science.
15. Where's engineering and geology. All Science Fairs are called Science and Engineering Fairs however there are not direction connections or explanations of content for engineering. This is the future of our children Having used the Engineering is Elementary program and knowing that students will be getting jobs in technology and engineering our state standards are flimsy at best. A monkey could teach some of the 3-5 content.
16. One finds oneself reorganizing the current standards to be much like the new standards when they are being taught.
17. How can something that is so shortened and so basic be an improvement? When students will be learning less in terms of science and engineering, I can't call them an improvement.
18. The layout is much better. The standards also demand a higher DOK and have way less rote memorization.
19. The draft does not match any textbooks in print, that I can find. The content and rigor are excellent.
20. The sequence of the content taught at each grade level is puzzling. Has the state considered unspiraling the standards and having us teach earth science in 6th, life science in 7th and physical science in 8th?
21. There are less standards for teachers to cover, I feel like I can spend some time and make sure students have a good understanding of each standard.
22. Much better than the 2004 model.
23. I do like that it is more focused and concentrated on three core areas. I really like the Distribution Chart so I can see how the areas grow and are addressed in different ways in different grades.
24. It only appears that things were moved around rather than having been changed.
25. The current standards have more detail within each concept. More explanation and gives examples
26. More detailed, but not quite enough. Still too vague

27. The new standards seem too fixated on models and investigations - where are all the supplies coming from?
28. Much better.
29. na
30. The current standards include cross cutting concepts and engineering practices, which is an improvement to the old standards. The old standards weren't challenging enough. The new standards also address climate concerns, which is incredibly important in teaching our youth.  
I am an 8th grade science teacher and have been teaching force and motion. I, myself, originally majored in physics. Because of my expertise, I am confident in saying that force and motion being moved from 7th grade to 8th grade is not an appropriate change. 7th graders lack the math skills required (algebra, mainly, but also slope/graphing) to successfully master force and motion. These math skills are taught in 8th grade and students are typically not ready to apply these concepts to physics until the middle of 8th grade. Physics is an incredibly important unit and it would be unreasonable to assign it to 7th grade. It should remain as a standard in 8th grade. Also, more emphasis should be placed on climate science.
31. I think the 2004 standards should be updated to align with current Science findings. But completely changing the Science standards is not necessary. Students will also have to repeat concepts they have already learned in previous grade levels due to this switch.
32. Random and unrelated concepts that seem scattered throughout multiple grade levels.
33. Less standards and information for teachers to utilize for planning. I believe new teachers will have a problem.
34. They are too broad and not specific. They omit discovery and experimentation.
35. The change of focus from performance objectives covering a shallow and broad range of science content to a focus on science and engineering practices is an improvement.
36. The standards are much better than the current POs. The key concepts make it as bad or worse. Remove the ADE additions.
37. As noted in item 13, rigor has been weakened.
38. The proposed revision weakens the statement about evolution, raising the possibility of questions that do not exist among professional scientists.  
The new Standards alters the evolution language by making it less obvious that it is true. It is suggesting we are still trying to get evidence that it exists. This is harmful to the development of a well-informed society and for future biotech workers in our state. There was no need to change the wording, and the fact that it was actively changed suggests non-scientists with political and religious leanings have corrupted the process.
39. The use of the word "may" in HS+B.L4U1.19 page 68 of the draft w/ internal review is one such case of the obvious bend against the idea of evolution.  
Much of the revision increases the quality and depth of the core ideas. However, the change to the "big idea" paragraph about evolution is weak and gives the impression that evolution can possibly happen. It does happen and it is scientifically established.
40. Too specific, though I do like the organization better. It is a marginal improvement.
41. I appreciate the focus on Earth systems as a whole. We lost the animal and plant cells focus as well as vertebrates and invertebrates. However, we gained the layers of the earth unit. Due to this being a testing year I appreciate consideration of focus and connection within the units.
42. It is a welcome change to have essential ideas instead of performance objectives. However the internal review tried to stealthily add more POs in calling them "key concepts."
43. This is much more organized than the 2004 standards and does encourage more connections. There is also less overlap between the content in different standards, and that helps clarify what the authors intended by a content heading.
44. I prefer the current standards. If we tweaked our current standards and reorganized a couple concepts to match up better I feel that the spiraling and coming together of content will work better.
45. Topics seem better integrated, and thought out.
46. This draft removes the negative effects of fossil fuels on the earth and our human impact. This standard is so important and should not be removed. It also removes the use of the scientific method
- 47.
- 48.



- and changes evolution to "the theory of evolution" These changes are merely political and are not necessary.
49. Simple, clear, and concise
  50. This DRAFT is a knock-off of the Next Gen Science Standards. NGSS seems to be more effective as seen in other states across the country.  
It leaves out standards that supported the drafted standards and some of the standards have been
  51. moved to grade levels that are less appropriate for the content. For example Newton's Laws are more appropriate for 8th grade at more depth in regard to the supporting math standards.
  52. The draft is written in much more user friendly language; standards are written almost what I would write for an objective. I think teachers will find it easier to confidently teach the state standards.  
It is good to see a clearer, specific section dedicated to the cross cutting concepts to this draft of the
  53. Science Standards. The charts and visuals are much easier to read, especially the grade level layout. The AZ 2004 standards with the performance objectives was too much and harder to read.
  54. Evolution needs to be taken more seriously in these standards  
For the middle grades it is hard to find curriculum that covers earth, life, and physical science. The
  55. new standards, just as with the current standards, cover topics in all of these areas. The strands need to be split so that in one year the earth science standards are covered, then the life sciences, and then the physical.
  56. It makes each content even thinner than before. And taking the math out of physics leads to no depth
  57. It is better organized and it is more comprehensive.
  58. I feel that the kindergarten area should contain more of the standards from the current standards. Students are given the opportunity to do as much hands on learning.
  59. There is more breadth of content in middle school standards.  
Having the key concepts to refer to is helpful in knowing how in depth to teacher the standard. It
  60. provides examples of topics to teach without giving specific curriculum. More key concepts in each area would be helpful.
  61. What the teacher in the classroom does with the standards is what counts.
  62. Yes, but subtle changes are needed.
  63. The standards are easier to read, easier to navigate, grouped sensibly, and more focused on a few broad ideas, instead of teaching a variety of topics without connection.  
The current standards don't scaffold enough. The DRAFT has the potential to refer back to standards from previous grade bands and really build upon them. However, the wording used in the DRAFT
  64. needs to be addressed. If the "key concepts" are moved to a separate document, then within those, references to previous grades' standards can be make. The language must be clear, though. Right now, the "key concepts" read "concepts taught in" AND "those listed in".. are these meant to mean the same thing? Does this mean reteach that standard? Does that mean scaffold onto and build upon the previous standards? Hopefully it's the latter, but this needs to be made clear.
  65. Standards are clearer, deeper, and more integrated.  
The 2018 standards are not an improvement, because the content has been moved to grade levels that are not suited to the development of the students in other areas, such as math. The content is
  66. too spread out and will lack the detail or depth needed for students to be successful. The content is in grade levels that are not appropriate to their development.  
The research and ideas included in the new standards are sound and appropriate. The standards
  67. themselves require additional language to make them understood by all educators to be taught in a consistent matter.
  68. Only looking at the work the committee did. All ADE changes that the committee did not approve should be removed.
  69. there is too much jumping around. No real focus. We will spend more time reteaching content before we can build on concept. I feel 6th should be Earth/Space, 7th Life, and 8th Physics and chemistry
  70. I feel they are more vague than the prior standards and lack rigor/detail. I'm concerned interpreting some standards that are written vaguely will lead to inconsistency in schools across the state.
  71. This is no better than it was with the previous version, except that more words were added to standards. Standards are more jumbled than ever before. Illogical sequence and grouping by grade level. Typically, the three science fields are life/biology, earth & space, and physical

(chemistry/physics). They are now even more jumbled together over the three grade levels of middle school. This results in teachers who are experts in biology teaching just a portion of biology and then needing to teach earth/space/chemistry/physics standards in addition. This same idea applies to a teacher with an earth science degree only being able to teach a small part of earth science at any given grade level and then needing to teach the other sciences. Same for teacher with chem/physics degrees. This is not what is best for students (or teachers, who are typically more versed and passionate in a given area of science).

- The draft of science standards excels compared to the current standards in theory and application.
72. The focus on the crosscutting concepts and the science and engineering practices adds a lot to the idea of teaching science. It is very different though in the broadness of each standard. It leaves a lot of room for different districts to be teaching different things within the same standard.
73. Feel like the new standards are broader than current standards and as teachers we will need a develop a roadmap of how to reach the end goals. We will need to break down the concepts and figure out how to integrate with other disciplines. Also, teacher training will be mandatory to ensure success.
74. Feel like the new standards are broader than current standards and as teachers we will need a develop a map of how to reach the end goals. We will need to break down the concepts and figure out how to integrate with other disciplines.
75. Inclusion into the design process is a much needed addition.
76. 7th grade students under the new standards will be taught force and motion - I feel they should remain within the 8th grade curriculum. I do not feel 7th grade students have the mathematical background that makes this a viable placing of the curriculum. Further, Chemistry, force and motion are all taught in 9th grade so there is a natural progression from what is taught in 8th grade to what is taught in 9th grade. Force and motion fits better with energy and chemistry which are 8th grade topics. Also, the idea is to move age of the earth to 8th grade which makes no sense since they are learning about fossils and plate tectonics and all that in 7th grade. How does one approach those topics without adding in the age of the earth? And how does age of the earth make sense with chemistry and energy? I think the answer in the former is "you can't" and in the later it is "it doesn't."
77. Previous standards were specific to a fault, whereas academic freedom is inherent in the revisions here.
78. What is Good about these standards:  
The wording in the standards for HS are definitely higher cognitive level activities. Instead of just "explain" or "list", the wording is "Construct an explanation", "Develop a mathematical model", "Investigate and Communicate", etc.
79. The DRAFT does away with PO peice of the 2004 standards. This new one gives the instructors freedom to explore different avenues for science learning
80. The focus on the big ideas is research based and a huge improvement. The move from discrete facts is critically important. Three dimensional teaching is also an improvement.
81. The inclusion of scientific and engineering practices along with the content is powerful. This set of standards as omitted key learning progressions involving evolution. Learning progressions centered around common ancestry and biological evolution are lacking. Standards that incorporate planning and carrying out investigations are lacking within the high school life science standards draft.
82. The DRAFT standards are written in vague terms and the content is not developmentally appropriate for Kindergarten.
83. I did not review the previous draft.
84. The new standards seem easier to follow.
85. These are not what the committee created
86. It is very similar with some added fantasy about having technology readily available for use in the classroom. Realistic timing is also non-existent.
87. They seem to be easier to understand and follow
88. The 2004 Science Standards explicitly states what it is expected for the students to be taught, and it is presented in a clear and present format. The DRAFT 2018 standards are not clear, and very wordy.
89. The set up of the standards is easy to follow along with compared to the 2004 version.
90. One concern we have is where/how the health standards connect with our science standards.
91. Our current science kits in kindergarten do not include earth and space sciences. I am glad that we are going to include this starting in kindergarten.

92. Overall, I am excited for the implementation of the new Arizona Science Standards because it will represent a needful shift in the expectations we place on our science students. I will be more able to implement a hands-on, minds-on, inquiry based curriculum, which will allow my students to deeply engage and understand the concepts.
- The changes that were made to the standards by the dept of ed. were not done in a transparent process and are not backed up by experts or documentation. Arizona is so far behind on education already and implementing rigorous standards that incorporate progression learning as students move through grades is so important. My first experience of Arizona education was my son's teacher at an International school he attended, letting me know how behind the students arriving from
93. Arizona were. She was not surprised my son had started his education in Colorado. After that time we decided to move to Arizona with concern and reservations at the poorly performing education system. It is so important to strive for a better education system and this starts with the standards that drive classroom teaching being developed by the experts (ie. the brightest scientific minds) in area of content.
94. It's cohesive and I like how it doesn't mandate teaching the scientific method specifically but put into the daily activities with the 8 practices.
95. Past science and standards did not correlate with each other and gradually include higher level within each grade level
96. I think it is a great start, but more fine tuning needs to happen.
- The page that mentions connecting the standards to ELA, math and other areas is helpful and problematic at the same time. ELA texts require text complexity and the topics of the grade level
97. standards do not align with the quality texts available for ELA. For example, EL Education, Open-Up has topics aligned to science that include texts for complexity. I wish that ELA and science would have collaborated since cross-curricular is how students learn best.
- I only slightly disagree because the way the subjects are divided is very foreign and makes the teaching more minute rather than larger concepts. I really think this will mess up the flow of the
98. scaffolding and lead to holes or repetition. Was it not possible to keep concepts where they are using the crosscutting? I understand you wanted to have over riding concepts, but it seems particular ideas were divided with a scalpel while others were moved in huge chunks.
99. The new draft is more visually aesthetic. It also details the information more clearly.
100. While the 2004 standards had too much, this has too little. Teachers could plan a year around the 2004 standards. Teachers can plan two-three unit with the new standards.
- First, "...the unity and diversity.." statement is clumsy, for lack of a better word, and I don't know what "unity" has to do with evolution, really. Next, "..diversity within a species are believed to lead to the selection..." denotes an uncertainty which doesn't really exist within this facet of the science. We
101. know that it leads to the selection. Strike the word 'believes', as that fact is not dependent on faith of any kind. This science comes from human thought, sometimes great leaps of intuition, followed by many hours and lifetimes of experimentation which is always built upon, or rejected, by others. Something may be 'thought' of as correct or incorrect, but 'believe' is misleading.
- I believe that standards should be in place to ensure that students learn in a progression. I do not
102. disagree with the standards as written, but I do believe that resources, curriculum, or more details are needed. If you would like more information, please feel free to contact me.
- The old science standards left less to interpretation and was more specific about what was included. I
103. think this draft needs more specifics as they relate to the broad ideas. They can be left open to interpret the ideas presented.
- So very much improved!! It is about time Arizona increase science rigor and allow flexibility in the
104. material/method used to teach (no more POs). These standards are far more cohesive across the grade level bands.
105. I like being about to see how the standard became more rigorous grade level to grade level in the current 2004 edition. However, I do like the Science vs Engineering appendix on the new DRAFT.
106. I agree for the most part but there are some scientific inaccuracies. What are force fields? I thought those were science FICTION!!!
- Many changes need to be made regarding these revisions. Scientific inaccuracies need to be
107. corrected, the revised "key concepts" either need to become actual key concepts or need to be renamed "vocabulary".
108. The 2004 standards were easy to understand, use, and implement into the classroom. They also provided students with a well-rounded view of chemistry.
109. Draft standards focus more on Science and Engiennering; constructing models, etc.

110. The other standards were far too specific. The new standards allow teachers to adjust based on location, prior knowledge etc.
111. What the independent review edited is a lot like the old standards.
112. These standards will be more likely to prepare Arizona students for the careers in their future, than the old standards.
113. It seems more rigorous.
114. I would strongly agree if all of the ADE additions were removed. Many are incorrect science or inappropriate for the grade level.
115. The new document is much more aesthetically pleasing and has a lot more concrete information as compared to the 2004 document.  
It seems as some of the content has flipped. Previously the standards were yes, more difficult to read because of the lack of true distinction between 7th and 8th grade standards however now the content which use to address 8th grade is now being addressed in 7th grade. My concern specifically has to do with the physical science standards as I worry many of my students will not have the skills they need to overcome the barriers associated with the mathematics behind the physics. I appreciate the emphasis on engineering and design thinking illustrated throughout the standards, and see this as a vast improvement to the previous focus on scientific method. Still, this improvement does not make up to the gap in knowledge my students hold in navigating the physical science standards. Another thing I appreciate is that the standards seem to be more cross curricular and embed moments for spiral review which is important for carrying knowledge from one year to the next.
116. 116. Not too sure about some of the standards changing from 8th grade to 7th grade and how well they will be able to be understood and work the concepts
117. 117. More rigor is offered, but should be scaffold more.
118. 118. Yes.
119. 119. There is a lot of crossing of the grade levels to emulate the national standards.
120. 120. I agreed but I am not sure until I start writing plans.  
I chose agree but am torn between disagree as well. Having taught 8th grade science I recognize the necessity of particular math skills to supplement. The standards are unclear as to whether grade level math content will be aligned.
121. 121. The content area has changed and schools will have to invest in new books, equipment and labs to get everything ready for next year. We need to keep the grade levels with the same content area and replace with the Big ideas and science and engineering method of teaching.
122. 122. Our team agreed that there was an improvement especially where the "Science Standards of 2004" used a "Distribution of Concepts Across Grade Levels," but as we looked over the new standards they were embedded in the key concepts.
123. 123. Concern for articulation and how the revised standards will be adopted and implemented. They seem to align with the Next Generation Science Standards but the sequence and grade breakdowns don't seem logical. (For example, cells, genetics, and reproduction seem to go together but are not introduced in conjunction with each other.)
124. 124. There are too many changes.
125. 125. There are too many changes.
126. 126. I think that we should of looked at the standard now and create more rigor and depth out of them.
127. 127. This draft is more focused and would allow all standards to be taught fully.  
I also have concern about having all HS teachers teaching all 10 essential standards, even when it does not connect with his/her topic. For example, how does DNA and mitosis connect with Physics? How would a Physics teacher teach these concepts?
128. 128. The number of PO in the 2004 standards made it difficult to touch on every topic. The reduced number of standards to focus on is a plus.
129. 129. The 2004 standards were even worse at least now there are less standards that can allow teachers to go into a little depth for each standard, but the problem is they still are not very good, just better than really poor standards from before.
130. 130. The new standards are organized around fourteen core ideas and develop learning progressions to coherently and logically build scientific literacy from kindergarten through high school.
131. 131.
132. 132.
133. 133.

134. In the perfect world, students would retain previous information and be able to apply it to later school years. To have teachers that are efficient in each topic, it makes sense to divide the units by topic. Currently the rigor for some subjects does not suit all grade levels. Also, many teachers have been hired due to their background and this could lead to teachers that are not teaching the content knowledge they are skilled at.
135. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
136. The United States could strengthen its position in the global economy by improving science education. I do not believe this draft fulfills that need. I urge Arizona adopt the Next Gen Science Standards to inspire our young people (especially female students) to consider STEM careers. In its current form it is a slight improvement, however, the current draft of the science standards does not reflect the necessary and sought-after shifts in science education as charged to the Science Standards Committee. A specific area of concern is the addition of a column of "key concepts" to the standards' detail. This addition has serious implications for interpretation of the standard. The key concepts are listed only as simple terms, without connection to the above-mentioned crosscutting concepts or the science and engineering practices. The result is a shift of teacher focus from rich connections in the standards themselves to a simplistic list of content-only terminology
137. As a middle school science teacher I like the Current standards. I think they are well organized. The content for 8th grade makes sense since they move on to high school and have to take biology, physics, and chemistry. The new standards are not well organized. It looks like the information was randomly divided between 6th, 7th, and 8th grade with no purpose.
138. While these standards eliminate a lot of nonsense from the 2004 standards they leave out Scientific Inquiry for 6th grade. This is a critical step in science education!
139. Cannot comment, I do not have time to review the older one.
140. More explicit now
141. The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.
142. They're too different to say they are an improvement.
143. They made a nice improvement
144. not enough information offered to have a side by side comparison. not sure what is different
145. I like that they are focusing on Engineering Process and Scientific method but the concepts seem really random. They took a lot of space concepts out and now we don't teach all the knowledge they used to have to know. What they picked to keep seems sparse.
146. The new standards seem all over the place and don't really have any structure to what's supposed to be taught.
147. Some of it is. I like that you have added in the engineering component. But some of the concepts seem very chaotic and out of place within the grade level.
148. I love that the school is implementing a more critical thinking which will prepare the students for problem solving and observing of situations. It would have been nice to have a side by side view of the changes made of the two standards.
149. It is an improvement.
150. I do feel that the new ones are not only more confusing, but it appears that they have omitted some standards/skills that were very engaging to the students. Since I don't know yet how this will all look in the classroom, I can only assume that activities like the unit on butterflies, for example, will not be offered.
151. There is not enough information to see a comparison of the old and current standards.
152. 2004 standards were more organized and on grade level
153. The standards are more pinpointed and build upon the previous grades. This allows cross grade level articulation and common vocabulary. Students will be more prepared for high school and college with these standards.
154. they are more pin pointed. allows for articulation and common vocabulary words.
155. We don't have enough information.
156. This is tough to answer. There are enough changes that we will need new resources and at this time



- have MUCH reduced to no extra capital.
158. I agree, if it is improved upon before finalized. In particular eliminating the key concepts from the document.
- I don't like either one of the standards for Arizona for Earth Science. Not enough geology in a state
159. where the rocks are all around us, not covered with vegetation. And we are a resource rich state, we should be educating our students about the geology of our state and our country.
160. These new standards seem more concise and allow for flexibility in how they are taught.
- This question is somewhat of a double edged sword. Are they better than 2004 science standards, probably. BUT are they the best they can be NO. It's imperative that we use the science standard developed by 111 science specialists who know and teach science. Science is science precisely
161. because looks at information objectively, without bias, and the information gathered is peer reviewed by others in the same field. Arizona students deserve to have unadulterated science standards, untarnished by outside influences who would like to weaken pure science and see their own belief systems reflected in the standards.
- I would answer this higher if I were looking at the standards without ADE's changes, as highlighted in green. However, ADE's addition of key concepts has taken the work of the committee and reduced it back down to a checklist of vocabulary. The way in which it is displayed is at an even lower level than the 2004 version of the standards, since at least the POs had a bit more context and weren't strictly a vocabulary list. Additionally, the ADE changes to the standards and the big idea descriptor for evolution is not an improvement. It a complete lack of understanding of the explanatory power of a scientific theory and attempts to treat evolution differently than all other scientific theories. All standards related to evolution need to be at least as strong as what is in the 2004 standard, rather than "dumbing down" the topic as ADE has done with their changes. Please consult with higher ed staff to understand this topic better so the standards are phrased in a scientifically accurate way.
162. I believe the current draft looks somewhat improved from the 2004 standards but in order to prepare our students for the future there needs to be more focus on engineering and computer science for
163. grades 4-6. Our school introduced more engineering and computer science with PLTW and STEM for those grades and they can easily relate and engage to the instruction because they currently use those topics more in the real world.
164. The Standards set forth by the committee before the internal review were a significant improvement. The internal review standards are basically the same thing now with rearranging.
165. The current standards either have too much room for interpretation or basically have a PO written again. I am confused as to what the goal of these new standards are.
- The new standards appear to open the door for more of a politically motivated interpretation of
166. science content.  
It also repeats some of the holes in science concept content that exists in the current standards.  
However there are now inaccuracy within the document that were not in the 2004 Standards. Also the Science and Engineering practices were not formerly known as the scientific method. Our 2004 standards did not have the scientific method in it nor should our new one. The science and engineering practices is a realistic way in which science is done in our world. It is not a linear process.  
If we have to take what is in green we will be in trouble as there are developmental inconsistencies, inaccurate science and a myriad of other problems
167. Over and over again in the document there are three major problems. The key concepts need to be removed. The continually addition of positive and negative is wordy and not necessary when discussing impacts. Continually referring to scientific method is also not necessary.
168. The 6th grade current standards have been almost completely cut. They are neither in the grade band above or below it. It basically is the current 5th grade standards.
169. not comment
170. close to what is happening nationally with framework - confused as to why
171. I am wondering if we will be given a curriculum to use so that I can teach these new standards?
172. I like the new 3rd grade standards, however, will we be given curriculum to implement these standards?
173. My students seemed to really like Space and the planets, which is no longer in the 7th grade.
174. Thumbs up.
175. The core ideas in physics are more clearly organized and described.
- 176.



177. Please leave in the word evolution versus biological diversity.
178. NA
179. Thank you for the clarity that comes through in the new formatting.
180. I like that certain standards are gone  
HUGE CONCERN
181. In the Evolution standard for life sciences the word 'evolution' is crossed out twice. I think that is a serious edit to cross out the word evolution in the evolution standard. I'm a little shocked to see this in 2018.
182. You are proposing to move the rock cycle from third to fourth grade. 4th grade standards currently focus on energy and everything connected to that. Our current 3rd graders will be getting the rock cycle twice and the weather unit has been taken out.
183. The standards based on NGSS are a clear improvement over the 2004 standards, but the unilateral editing of them for political purposes on the part of Douglas has diminished them.
184. The old draft included the Big Bang which is important for students to understand as it affects all of us and is a major area of study within the scientific community and should not be left out of a science class.
185. The deletion of evolution and Big Bang theory need to be included in these standards
186. See previous comments regarding evolution and the Big Bang Theory.
187. Taking out Evolution and the Big Bang theory just makes NO sense whatsoever. Again, let actual scientists and science teachers write the standards, not bureaucrats who know nothing about science and don't believe in established scientific theories and FACT.
188. You're removing key scientific theories!!! Insane!
189. Until the big bang theory and theory of evolution are included these standards are a joke.
190. it encompasses some content that was not covered in current standards.
191. What is with U4? That whole section should not be a part of the standards. That's someone's opinion. Why is someone's opinion a part of my curriculum? I teach facts.
192. If in 2018 we are not teaching our children about necessary scientific discoveries then we are going back in to a dark age of knowledge.
193. They do not explore evolution and big bang theory....a scientific reality
194. The 2004 are much easier to navigate.
195. Put the science back in, throw out the religion!
196. Except the removal of evolution and the Big Bang. Keep religion out of my kids science classes.  
I side with the superintendent on this one. ALL theories of cellular creation should be explored or NO theories should be explored. If my child brought home an assignment regarding evolution or the big bang theory I would expect my child to also bring home assignments regarding other theories. Our family believes the earth is only 6000 years old and it is NOT the place of educators to try and make my children question their truth.
197. The focus on science inquiry and exploring science in a multidimensional way is a huge improvement on science standards compared to 2004. The reduction in the number of standards is also a key part to improving standards to ensure students are able to master topics.
198. Why on earth have you removed references to evolution and the big bang theory???
199. Using organizational components from NGSS is a needed change, the POs are looking like vocab lists which is not concepts.  
No is not. Taking away some specific words and theory and opening to different opinions (religious views) is not an improvement.
200. It will confuse students about science. Opening schools to different theory not sustained from any scientific evidence.  
It's like praying for your high blood pressure, or take the medication.
201. They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.
202. The National science education standard are better.
- 203.

204. Allow the teachers to prepare the wording and leave the politician's rhetoric out of the classroom.
205. Evolution needs to be in the curriculum
- The Arizona Science Standards currently in effect are thorough and strong. In fact, in some grade levels, they are very closely tied, and even exactly the same. It seems that the new DRAFT standards stray slightly from the cyclical/spiral teaching of concepts starting in early grades. The idea to spiral
206. concepts through multiple levels is in line with early childhood development and the development of early adolescence. Exposure to content multiple times, increasing in difficulty/complexity is important to overall conceptual understanding, as well as deepening knowledge for application in other disciplines and concepts.
207. It's difficult to categorize leaps backward as progress. Please revise the document to include actual scientific theory over theological speculation.
208. The standards align better to overarching concepts and are easier to read, but omitting widely accepted science theories, Evolution and Big Bang, is a disservice to our K-12 students.
- The standards themselves are basically the same, except now strands 1-3 (which I view now as the crosscutting concepts and practices) are mixed in with strands 4-6 (what are now the core ideas), and
209. standards have been shuffled around between grade levels. The only real difference I notice is the addition of the connections to other disciplines section, which I do think is beneficial.
210. This draft is more detailed.
- The old standards flow better. Too much change in each grade level from one type of science to the
211. next. It would be a lot easier for all involved if we broke it down by grade level such as 6th grade does life science, 7th grade does earth science and 8th grade does physical science.
- With the current state of the standards I disagree- the "key concepts" column limits teaching and the
212. differentiation between "Essential" and "Plus" makes for a curriculum that will be missing essential pieces of any science course at the high school level.
213. Better the lousy Science Standards we currently have than to replace them with even worse "topics."
- There is no mention of the scientifically accepted concepts of evolution or natural selection. These are
214. core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.
- Again, these standards seem like a watered down version of the 2004 standards. It seems that
215. science teachers were not involved in making these standards, otherwise there would be more accurate evolution standards.
216. Not really. I see that it has more education lingo, but not more Science.
217. As it stands these new standards are ambiguous when compared to the old standards.
218. The current standards are perhaps too specific, in some cases, but at least educators knew what was expected and knew where the state wanted us to take the students.
- I am excited to see more emphasis on forces than we had in the past. I am opposed to the idea of
219. wedging in a unit on Universal gravitation when the mathematics is above their level. Our primary focus should be developing an understanding of scientific inquiry and passion for scientific learning that will be addressed at greater depth as their science education continues.
220. There were very few changes for 4th grade science.
- They are cleaner and more clear. The original standards before the newest revisions are thorough and
221. provide guidelines for connections to be made by teachers and students. Many of the AZ revisions are unnecessary and actually will make it more difficult to teach.
222. The 2004 standards addressed the Big Bang Theory and theory of evolution, which are worthy of studying and will benefit all students.
223. I like the structure and more comprehensive content coverage in the current standards better. The Next Gen standards are also better than what is here in the draft for earth science at this point.
224. I'd like to see more of a focus on problem solving. These standards, like the 2004 ones, focus too much on details to memorize.
225. The new standards have an improved organization, however, the varying content is lacking compared to the old standards.
- I think it could be stronger if the key concepts were removed. The key concepts seem like a check list
226. of concepts that need to be memorized, which is what the current (2004) science standards are. To reflect the nature of science better, those should be removed.

227. I agree that the draft is a much better version for the standards if the adjustments are made on the organization.
228. I believe we are heading the right direction but we are not there yet.
229. The teacher and education leader revisions are good, however the recent rolling back of critical thinking and emphasis of terminology is troubling.
230. did not review
- While they used the SEPs and CCCs, they chose not to use the DCIs from NGSS. Instead, they integrated a similar list from a group in the U.K.
  - NGSS focus on big ideas and stay away from providing a vocabulary list. Instead, they allow teachers to determine the best path to the big idea. The AZ standards have included a vocabulary list for each standard.
231. - The NGSS and AZ standards are not aligned meaning specific different topics are taught in different grade bands.
- In NGSS, CCCs are integrated into specific performance expectations across K-12. In the AZ standards, specific grades are asked to focus on specific CCCs through middle school.
  - The language on evolution has been "softened" as compared to NGSS.
  - The practices are referred to as 'formerly the scientific method'. The NGSS goes out of its way to say that this is not the case.
- I can see a watering down of scientific rigor in the new draft, the previous standard seems scientifically more accurate, the new standard seems to attempt political correctness and avoiding controversy instead of staying scientifically accurate. Science is not politically correct, that is why people like Galileo was arrested for speaking the truth. Science is about finding the truth without fear of favor and this core principle of science is betrayed by the edits proposed here.
232. See above. I do not approve of any attempts to deny evolution or the Dept of Education's possible refusal to educate our children on the concept.
233. I think we are still dealing with a choppy flow, rather than a spiral. For example body systems are mentioned in 3rd but not brought up again until 6th. It is hard to spiral with a several year gap. This the same problem that we are currently having.
234. These standards are not an improvement on the current standards. The current standards require too many topics to be covered in a year without students getting a deeper understanding of the topic and the new standards are even worse. They require even more topics to be covered with less depth.
235. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
236. The draft of the 6th grade science standards has too many standards to teach effectively. These would be more realistic without the addition of the key concepts.
237. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
- I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
239. The old standards included much more content at some grade levels, making it difficult to teach everything in one year. The language of the new standards is more specific regarding what students are expected to do.
240. Downplaying the role of organic evolution as an anchor concept of Science is shortsighted. The standards need to align with the national standards in order to help students gain a true understanding of how the natural world works. The only thing is life that is certain is CHANGE and the scientific community overwhelmingly supports the Theory of Evolution as a major tenant of Science! Let's not take a step backwards with these standards and improve things in alignment with the national standards.
241. I think both are mostly the same. The new standard does have some updating of ideas.
242. It is definitely an improvement from the 2004 version since it has learning progressions, practices, and cross-cutting concepts similar to the NGSS. The original document as seen in black text is far superior to the "internal review" version with added green text. The changes made by the government do not reflect current research-based knowledge about how kids learn best. Knowing what's best for students and then reverting to the old outdated and ineffective way of doing things is

- unethical and frankly unconscionable. Here in the US, we are way behind other first world countries on producing graduates who are confident and competent in science and math. Standards like these are exactly how we got here. Please refer to this article: William H. Schmidt , Hsing Chi Wang & Curtis C. McKnight (2005) Curriculum coherence: an examination of US mathematics and science content standards from an international perspective, Journal of Curriculum Studies, 37:5, 525-559, DOI: 10.1080/0022027042000294682
244. The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.
245. Key concepts brought back from 2004 don't improve student-centered learning. Science is not about memorizing a bunch of vocabulary words.
246. Parts are very good but the edits need to be unedited!
247. The edits made to the draft make the document inferior to the 2004 Science Standards. If they are adopted without the unneeded edits, they will be an improvement.
248. I teach AP Biology and if you take out evolution from the standards - you've taken out one fourth of the content for the AP Biology Exam. In addition, the big bang is also one of my standards. Why the anti-science take on science standards? Evolution and the big bang are very real theories and that is our job to educate.
249. See above answer.
250. Evolution needs to be a focal point in the standards. There should be no rewording of phrases involving evolution. Students need to completely understand how all aspects of biology are connected to the Theory of Evolution.
251. It's fine.
252. Keep evolution in our schools, we are doing a disservice to our children and they will be left behind in the scientific community by removing these basic ideas.
253. The deletion of basic widely accepted scientific principles is in direct opposition to promoting thorough and well documented science facts and curriculum. Incorporating ideology into the science standards is COMPLETELY UNACCEPTABLE. These changes are antithetical to the core of science education FYI- I'm a National Board Certified Teacher, Biologist and Field Scientist and College Professor. I reject this document as a distortion of scientific facts and thereby unacceptable and falling below the standards that should be addressed in the curriculum
254. See above.
255. Replace the missing content.
256. Equivocation of Evolution is for political and religious purposes and has no place in public institutions
257. I cannot believe in 2018, that the religious right and other "non science" people are trying to screw up science by messing with the theory of evolution. After 20 years of watching this happen, I am amazed by the ignorance of some who cite "Well, its only a theory". The moment they say this, they are announcing their own science ignorance. And if we include "creationism", then why don't we include every one of the other 2000 creation stories in the science curriculum, along with Christianity. This is an embarrassment to AZ and to science teachers.
258. Evolution study was clearly outlined in the 2004 document but has been removed from the 2018 document.
259. Need to define evolution appropriately.
260. Well, the removal of the word evolution is pretty ridiculous and grateful disappointing.
261. I don't think you should remove the word evolution. It's a term used in science all over the world and it needs to be included in the science standards.
262. No positive change is noted; similar issues with both as they will not allow for concepts to be taught in a logical order building upon skill and readiness for each scientific discipline.
263. I prefer the 2004 Standards
264. Parts of the revised standards are designed to devalue accepted scientific standards.
264. N/A
265. With the notable exception of recent edits (such as challenging evolution), the draft is an improvement.
266. After 14 years, this upgrade is necessary and I think well done

267. I did not review the 2004 standards
268. At least I knew what was supposed to be taught in a physics class.
269. Teach evolution and medically-accurate, age-appropriate sexual health education. Leave theology and religious doctrine out of science classrooms.
270. Downplaying the FACTS of EVOLUTION is not "science." It is not your job to advance the religious nonsense pushed by the AZ Republican Party. Your job is to make certain FACTS and SCIENCE are taught throughout AZ's PUBLIC schools. Parents who are made sad by science & facts may place their children in PRIVATE, religious schools.
271. The directive from the State Board of Education was that the standards are the concepts, not minutiae. The inclusion of key concepts is very similar to the POs that the work teams were told to remove. The UNMODIFIED version of the draft (as it was written by committee) is an improvement over the 2004 standards.
272. Assistance with interpreting the standards and drawing correlations between content areas should exist in separate documents – not the standards document.
- I feel that the previous standards had more specifics, that they included nature of science, history of science, etc. These standards do not. I felt they were more cohesive and less jumpy. The new standards seem to jump all over the place and don't leave any room for developing a scope and sequence and building knowledge over time. The move to 7th grade of Newton's Laws is inappropriate for that grade level. They had a focus previously on space and also earth science. I think that there is only a tiny amount of earth science plopped into 8th grade and I am not sure why that was done. I don't think that studying wavelengths is appropriate for 8th grade. Students are not going to see the value in that.
273. See above comments about evolution and magnetic fields.
274. Much more rigorous this go around.
275. Removal or minimization of evolution is unacceptable. It is not an ideology and is not controversial in the scientific community. Educated students must be able to be conversant in evolution to be taken seriously in the world.
276. The omission of any mention of evolution in the DRAFT is an unconscionable oversight and needs immediate correction.
277. N/A
278. Not after the cross-outs I see.
279. The organization of the 2018 standards makes it more difficult to track growth in a concept across the educational time period.
280. The concepts of planetary and biological evolution (big bang theory, natural selection, etc) are covered much more strongly and accurately in the 2004 standards than the current draft.
281. Keep Diane Douglas out of this process!
282. Both sets of standards are weak on details. The 2005 document contained standards on the critical analysis of evolution, Big Bang theory, and the origin of life. These important topics are missing from the 2018 standards. The 2005 standards were superior in their coverage of the nature of science and inquiry. Both sets of standards are reasonably balanced in coverage of environmental topics.
283. This draft has not improved the current state of at least middle school science, you have further torn apart concepts that students can not make connections.
284. They are an improvement in that they are focused more on integrating science, engineering, and math.
285. Overall, the draft standards go into more detail and explain the concepts more thoroughly.
286. It is definitely an improvement, but this improvement is still not efficient. Many of these standards are incredibly broad.
287. I do like the transition from the scientific method into science and engineering practices. I like the addition of "ask questions" in Kinder.
288. I Strongly disagree with the removal of "evolution" and "Natural selection" (in grade 8 standards) This is absurd. These are prove and supported tenets of science. These should absolutely NOT BE REMOVED
289. We have developed a system in this state of giving formative assessments then summative to evaluate student learning and teacher instruction. It is extremely hard to assess one skill when



- students are learning several in combination. So we have devised a set of formative quizzes to work through the content, one by one or in tandem. To now see for example that all of the training on what the Inquiry process is, is thrown in the mix with each of the core standards Life, Physical, Earth/Space is completely overturning the apple cart so to speak on the work you are giving teachers for the next few years to develop when we already have a strong, state wide system in place...Beyond Textbooks from Vail and Solution Tree training that has been given to us over the past 10 years is what I am referring to. The 2004 standards did separate Inquiry Process from the other standard areas, though we could choose our content to practice the skills in, but those skills for Inquiry Process were listed out in detail and that was more helpful than what I see here.
288. Evolution is real. It is agreed upon by the scientific community and should still be included. Completely. Not abridged.
- I strongly dislike the spreading of scientific principles across grade bands in hopes that a) students are enrolled in a school in Arizona with our standards, b) there is similar pacing within and among
289. districts to ensure that students who move within the state don't acquire gaps, c) all positions are filled by highly qualified teachers who will actually teach ALL standards with scientific accuracy and d) students will remember chunks of information from year to year to build upon.
- I wish there was a neutral selection. I am pleased that there is some effort for Arizona to be consistent with the rest of the country and the National Science Teachers Association to have a three dimensional approach to science education. I truly do not understand or agree with using the
290. "knowing and using science" borrowed from the United Kingdom and not our "Framework for K-12 Science Education." That shift alone would make these standards an excellent improvement over the current standard.
- WHY are we taking references to evolution out? Have we gone backward in time? This is incredibly disheartening to see even as a possibility. I, and many many people in this state, demand separation of church and state! Let us not lose progress!
291. Some are good because of the Engineering part of it but not the content. I attended Modeling workshop in ASU and this are the topics in AP physics with expensive materials needed to discuss.
292. more details except for the problem with modifying "evolution" with "theory of" also; "traits within populations change through evolution" would make more sense...and "biological diversity as expressed through evolution"
293. I fully support the draft of science standards before the edits have been made regarding evolution etc. The prospect of removing evolution from science education is asinine
294. At least the previous version stated evolution as factual.
295. The change in wording over evolution is puzzling. Definitely a step backwards.
296. 14 years later and we still gotta cut evolution out of the curriculum? We will never produce any scientific rockstars if we stifle them by poorly drafted learning standards. Our children need to get all of the information available to them and give them the chance to process it.
297. I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
298. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
299. Yes greatly improved! As sent by the 111 science specialists in November 2017 (left unchanged).
- Removal of the word evolution is being done to open the way for religion in the form of "Intelligent Design" to be taught. Teaching ID instead of evolution is like teaching Astronomy instead of Astrology. If Intelligent Design is introduced into Arizona schools it will be challenged just like it was 12 years ago in Kitzmiller v. Dover.
300. The changes are unacceptable.
301. This draft is mostly better, but The NGSS are better.
302. Many of the changes which align AZ's standards with the NGSS are definitely an improvement of previous standards. But changes that attempt to dilute the presentation of evolution are completely unacceptable and should be rolled back.
303. The revisions are making a deliberate attempt to water down the importance of evolution in biology. It is a central, unifying theme in the life sciences and the revisions have changed the wording and removed terms such as natural selection and evolution. This is unacceptable and flies in the face of established science. No academics or scientists would approve of such watered down language. This change is based on an religious/political agenda with a deliberate attempt at suppressing evolution. Evolution is an established fact in science, a research framework for a massive number of fields in the
- 304.



life sciences (genetics, paleontology, animal behavior, ecology, etc.). It is essential for medical research concerning pathogen resistance and well established in agricultural practices of pesticide use. These are issues our modern world faces today and students must be equipped with the knowledge to combat these problems in our future.

I cannot comment on all the boxes as it is too much to fill out. I will reference here all the areas that I see needing adjustments.

To many of the standards use fuzzy terms such as in 8.L4U2.11. "...natural selection may lead to...". There is no "may". It does. It is a well established fact. The same use of the word may appears again in HS+B.L4U1.19.

Other aspects such as the omission of key evolutionary terms such as adaptations and natural selection. Once again. These are established facts in science. The standards give the impression that they are fuzzy or not well supported.

305. In addition, the most serious issue is the omission of the word evolution in 8.L4U2.12, HS.L4U2.31, and HS+B.L4U2.20. This is unacceptable and is evidence of an agenda to water down the well-supported biological phenomena of evolution. The process of evolution is the central theory in biology and is the only valid explanation for the diversity of life on Earth. This is a crucial concept for students to understand. Not only that, but it is highly relevant in modern medicine with the issues of antibiotic and viral resistance to drugs.

Another interesting omission is the Big Bang in HS.E2U2.17. The Big Bang is a very well established fact in science. The removal of the term is reckless and misguides students. Not only that, the passage, "Analyze, interpret, and critique theories..." is ridiculous. Students at this age do not have the in-depth knowledge to "critique" a highly complex and mathematical theory that explains the origin and evolution of the universe. Critique, in this case, implies an alternative. There is not one.

306. The modified language deviates from accepted scientific fact and would effectively force the student to "learn" a non truth, this sets them up for failure down the road. Students should be taught the sciences according to the accepted truths of the science community.

307. The removal of vital information does NOT improve current Science Standards.

308. Needs to go back to review.

309. Any weakening of scientific principles and knowledge about matters such as climate change and evolution should be strictly eliminated. It is a gross misrepresentation of objective human knowledge to weaken the vast knowledge of evolution and climate change or to contend that other religious theories have equal standing--or any standing.

310. The current standards are far more developmentally appropriate and the students thoroughly enjoy the space and matter units. Reproduction is not appropriate at this level, learning about the skeletal, muscular, and nervous system is far more appropriate.

311. Please review.

312. The current draft is very difficult to read. There's no explanation of the "strands" but they are listed on the "connections to other academic disciplines" page. There seems to be less emphasis on the human body and its functions in the elementary grades.

313. Send back to committee.

314. See above comment.

315. Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution.

316. Diane Douglas should be ashamed of herself for the edits.

317. Again, "intelligent design" is a religious tool and has no place in public education. Parents that do not want their child exposed to scientific theories can take their child to religious school. Public schools and curriculum are not the place for religiously biased teaching.

318. Dissapointed about the omission of evolution

319. There is important environmental and evolution content that has been changed or is missing.
320. This draft is a significant step backwards from the 2004 standards. We should be upgrading the science standards, not go in reverse.
321. Needs review
322. It is vague, repetitive and politicized.
323. Includes modeling of concepts which is improvement
324. No comment.
325. You have gone out of your way to censor the draft by minimalizing or attempting to eliminate any reference to evolution, presumably to satisfy your religious bias in this area. Science class is for science!!!!!! This draft is no better than the 2004 one you are claiming to update. SHAME ON YOU ALL!!!!
326. The organization and the addition of the material is. To pull out evolution feels like a religious influence. We are not telling preachers how to preach, so I'm not sure why teachers are being told what they can teach if it is the scientific standard.
327. These science standards are not developmentally appropriate for children. Gwnwtics in 5th grade is insane!
328. Needs to be updated regularly, we wouldn't want our children to learn outdated or inaccurate information.
329. The current DRAFT refers to evolution in an unacceptable way (see comments above). This needs to be changed if we are to appropriately educate students to solve future problems and keep the world a safe place (especially in Arizona).
330. I am commenting on the DRAFT Science Standards from the Committee NOT as amended by the the ADE staff and Superintendent!
331. It is an improvement \*only\* if recent changes are reverted, in particular the watering down of references to evolution and the removal of implications of scientific doubt and uncertainty where none exists. Even then this remains a weak curriculum until the teaching of the scientific method is simplified, clarified, and restructured as foundational organizing principle at all stages.
332. If you remove evolution from the Science Standards then they aren't worthy to be called "Science Standards". Stop making education a political issue. Evolution is scientific fact and must be part of any reasonable education standards.
333. Do not remove references to evolution. Evolution is part of science. You remove that and you are removing fact-based education. It is important for the general populace to be educated with facts not fiction. Do not remove evolution.
334. While I haven't read the full draft, I've heard Diane Douglas' comments about adding "intelligent design" to science curricula, and am strongly opposed to it. Religious dogma without research or evidence has no place in a science class.
335. Standards that ignore what science has proven is like teaching a fiction story and calling it fact just because it was in writing. That is not what science does nor do we want scientists limiting their search for facts because the bible story says creation happened in 6 days. Religion needs to be separate.
336. It is different and not necessarily an improvement. The organization is nice for teacher's to potentially follow but the altering of politically sensitive but not scientifically controversial topics is concerning from the perspective of someone in higher education.
337. Include evolution
338. The draft is more rigorous but lacks some examples and ideas to support the teacher.
339. We should only be covering evolution in school. Creationism should be kept separate from schools.
340. The current draft will require students to be engaged in learning science rather than memorizing facts/details. However, the key term column is a deterrent to the rigor of the standards. One could focus on that column and miss the rigor and the content that is written in the actual standard.
341. The Language has been changed in a negative way with the effect of watering down well-established science like Biological Evolution through Natural Selection, the origin and age of the universe, the age of the Earth in geology, etc. In the 2004 standards one of the topics was "The Origin an Evolution of the Solar System". This doesn't appear anymore in the new version.
342. The striking of references to evolution and allowance for teachers to instead indoctrinate students with the so-called theory of "intelligent design" is alarming from a constitutional standpoint, and wholeheartedly unscientific. Understanding the theory of evolution is critical to science education, and

- will put Arizona students at significant disadvantage when it comes to understanding key developments in the fields of medicine, biology, and more.
- Regardless one's theological beliefs and personal skepticism, the fact remains that evolutionary theory is currently vastly accepted by the scientific community, and intelligent design is not. Arizona educators have an obligation to the truth which compels them to relay this to their students.
- The removal or obfuscation of widely accepted scientific information and theories (e.g. Evolution and Climate Change) is highly disturbing and counter to the fundamental purpose of primary and secondary education - to prepare youth to be active, knowledgeable, and productive members of society after they leave school. Censoring valid, peer-reviewed science because of theocratic dogma (especially when not all faiths embrace the same dogma) is only going to accelerate the decline of the United States from being a worldwide leader in innovation and scientific research to becoming eclipsed by most other nations in these areas. Science begets innovation, Innovation begets new jobs, New jobs begets economic prosperity for the future.
343. The proposed new standards need to employ the concepts of evolution, of relativity and other umbrella concepts as the structural catalogue to understanding connection between subject areas.
344. The old standards are just fine. Why are we changing?
345. See above comment.
346. the current draft would be doing the students a disservice by dropping evolution, the unifying theory of biology.
347. the last standard was bad enough and you wonder why math and science in this state lags behind most of the country except maybe coal country
348. It is unbelievable that you would reduce the importance of evolution in the curriculum. Creationism is NOT appropriate in a science curriculum.
349. C'mon folks, the next thing you will be trotting out is the "Flat Earth" concept as a legitimate hypothesis! Do you want your children learning that?!
350. This version introduces skepticism regarding evolution when there is none. Evolution is one of the thoroughly accepted concepts of the science curriculum.
351. Evolution ought not be replaced as it is a valid science term and not related to any religious belief.
352. Removing facts is not an improvement.
353. The mention of creation science and the refusal to teach evolution is an abdication of the school's duty to teach the facts. Without the concept of evolution, the biological sciences have no meaning. Creation science is not science. It is superstition masquerading as science. Lets not dumb down the Arizona schools any more than they already are.
354. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
355. This DRAFT should not be adopted because it leaves out Evolution and includes Creationism.
356. Evolution should be taught at all levels, not creationism. Leave religion out of the science curriculum please.
357. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
358. Why were references to evolution eliminated? Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
359. I am concerned about the movement away from the fundamental facts of science such as evolution toward the teaching of intelligent design (aka creationism). Not only am I concerned about this adversely affecting my 9 year old niece and public school student but I am offended by the sheer disregard for those who do not subscribe to these beliefs. If you wish to add intelligent design to the teaching then you must also include the alternatives to this such as scientifically proven evolution. Using the education science standards to push forward religious belief is reprehensible. I am also certain that this type of action will be legally challenged and unable to be implemented, and will be a waste of tax payer dollars in addition to a waste of student, teacher, administrator time. Let's let science remain science (unless we now have scientific proof of intelligent design).
360. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
361. Taking out evolution is not a sign of progress, it is a step back toward the Middle Ages when religion and superstition constituted 'education.'
362. New standards teach religion, not science. Old standards at least focus on science.
- 363.

364. Creationism (aka intelligent design) has no place in a modern science curriculum. As a person of faith, I wish my children to learn actual science in science class, and religious doctrine at our church.
365. Removing 'evolution' from AZ Science Standards is taking our children to the dark ages for education. There is a separation of church and state. If the Superintendent wants her kids to learn about religious ideas, then put them in a religious school. If we are talking about public schools and ALL children, then we need to teach scientific materials that are accepted around the world!
- Adding "both positive and negative" to the U4 core idea obfuscates the idea that some aspects of science are morally ambiguous - it simplifies something that is not simple, possibly to the detriment of student learning.
366. The new statement about evolution, L4, softens the language in a way that is inconsistent with the scientific consensus about evolution, and how evolution has caused the unity and diversity of organisms. I think it was phrase better before, and it is odd that in the standards, you refer to the "theory of evolution" but do not similarly couch other scientific theories, for example, you do not say "the theory of conservation of matter", you just say conservation of matter. It is inappropriate to introduce ambiguity where there isn't ambiguity. Removing the standard about natural selection is inappropriate. It is not clear why the Big Bang Theory is removed from the science standards.
367. Deemphasizing evolution concerns me. Evolution is a fact. The theory of evolution changed only in minor details since Darwin first proposed it. Anthropologists, biologists, archaeologists, et al., filled in many details since then and continue filling in more details. All of the findings only refine the theory.
368. No intelligent design. This is a fallacy. Evolution should be the only "theory" taught in school. It is a theory just like the theory of gravity... not because it is not real.
369. See comment 17!
370. My understanding is that this draft proposes to teach intelligent design as a complement to or alternative to evolution. This is a change from previous practice.
371. Eliminating the concept of evolution in favor of "intelligent design" (creationism) is not only scientifically inaccurate, it's been declared an unconstitutional advancement of religion in our public schools. Let's keep religious concepts in the churches, mosques and synagogues where they belong, and teach our kids real science in the schools.
372. All references to evolution have been removed in this DRAFT. Understanding the theory of evolution is critical to the fields of medicine, biology, and more. Allowing teachers to teach religiously-based "intelligent design" doctrine about the origins of life is not science. Moreover, teaching intelligent design- a.k.a. creationism- has been ruled as unconstitutional advancement of religion in public schools by Federal court.
- Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
373. Leaving out critical theories based on mountains of empirical evidence will make us look like fools and will seriously harm our children! I am vehemently opposed to using religious dogma to influence education in any way.
- Removal of how species of animals have evolved over time and the teaching of the Theory of Evolution will lead to our children being under-educated or misunderstanding many sciences.
374. Understanding the theory of evolution is critical to the fields of medicine, biology, and more. We will be doing a disservice to our children and our future, we will not be able to compete globally in these, and other, scientific fields without proper Science education and understanding.
375. Not religious. Create a religious studies classes that goes over how ALL religious concepts of human creation, that can only be taken if the student - not the parents - willingly enroll themselves
376. My understanding is that this draft promotes intelligent design as a complement to or an alternative to evolution.
377. Removing evolution OR adding creationism/intelligent design is yet another embarrassment for Arizona. Science clearly accepts evolution as the leading theory. It rejects faith based ideas. That isn't science!!
378. The rescission of de facto evolution verbiage is refreshing and hopefully opens up discussion on alternative theories of the origins of the universe, plants, animals, and man.
- The main area on which I have comments relates to the exclusion of information about evolution!!! AZ students will find themselves at a disadvantage if they don't study evolution because it impacts on all the STEM fields that AZ schools are so strongly being urged to focus on. As I understand it, the proposes standards will allow students to learn about 'creationism' or 'intelligent design' as some refer to it, which is NOT based on science but rather reflects specific religious doctrines and not even all of those, as several of the many faiths practiced by AZ students and their families (and there many, with a large number of students practicing no religion) to include Catholicism and Judaism accept evolution!!
- 379.

380. The Science Standards must retain the terminology and the study of evolution.  
Based off "general impressions of the organization, content, and rigor of this DRAFT, and
381. recommendations to the State Board." NO. How is removing science from the science class an improvement?
382. It is too confining in how it is taught.
383. Send the standards back for review.
384. Understanding the theory of evolution is critical to the fields of medicine, biology, and more. We can not allow religious ideology to influence our public school's curriculum. This is not a theocracy.
385. The use of the term evolution is absent.
386. Intelligent Design is not an alternative to Evolution.
387. Creationism/intelligent design should not be included. It violates the principal of separation of church and state. Evolution and scientific fact need to be the focus.
388. The 2004 version INCLUDED Evolution, and didn't include the sophistry and lies of "Intelligent Design". Apparently the proposed 2018 version does the opposite. Since when is it "education" to teach LIES? Only in Orwell's 1984.
389. Science Standards should only be set by scientists and teachers of science in the schools and universities.  
Understanding the theory of evolution as such -- calling it evolution, and calling it a scientific theory in the full sense of that word and not its popularized misunderstanding -- is absolutely critical to understanding everything in biology. Without evolution, nothing in biology makes sense. Substituting weasel phrases like "changes over time" is an exercise in pedagogical bafflegab by the Dunderheads for Jesus crowd. Revert the standards for evolution to their current wording. There's nothing wrong with them.
- 390.
391. No one should be teaching creationism in public schools. This makes a travesty of science education
392. Evolution should be taught, not intelligent design which is religious doctrine. Evolution may be a theory but there is substantial evidence of its merit. Gravity is also a theory. Intelligent design is totally lacking in scientific evidence.  
The theory of evolution is critical to the fields of medicine, biology, and more.
393. Please do not disadvantage Arizona students in the name of religious politics.
394. Keep the constructed ideas of 'creationism' out of science as 'creationism' is simply a 'bastardisation' of science.
395. Ignoring accepted science theory is definitely NOT an improvement.
396. Please do not teach creationism / intelligent design as science. That's for church, not publicly-funded education.
397. The draft eliminates information about evolution which is essential to students' scientific knowledge base.
398. Promoting the religious concept of intelligent design has no place in a science program
399. Removing the teaching of FACT BASED evolution with the option to teach non-fact based religious based creationism in public SCIENCE classes is blatantly unconstitutional and will put Arizona students at a significant disadvantage.
400. See above.  
To say that evolution is "just a theory" demonstrates a gross misunderstanding of science. Biological evolution is not "just a theory", it is the most robustly demonstrated theory in all of science. By omitting this fundamental concept and achievement of the scientific method severely disadvantages the children of Arizona. They will not be able to compete with the jobs of tomorrow. Job in bio-science and medicine make money and cure diseases because they are founded on reality: the reality of evolution.
401. Do not let ideology or ignorance hold our future back. Put evolution back into the curriculum. Facts aren't ideology. Evolution is a fact. You test it every time you get a flu vaccine or eat food from plant and animals humans have changed and domesticated over the last 10,000+ years.

Shame on Diane Douglas. Keep your religion out of our schools.



402. Our science standards need revising, but removing what our teachers put forward so that you could include sectarian religious dogma (i.e., "creationism" and "Intelligent Design") is highly inappropriate. It is making our state the laughingstock of the country.
403. To misinform children about evolution is something that belongs in Sunday school, NOT in public school! I am very upset that this is even being considered as part of a sound science curriculum.
404. The study of evolution is a critical element of Life and Physical Sciences.
- I disagree with the removal of the terms "evolution" and "evolve" and the insertion of the term
405. "intelligent design." Teaching intelligent design - a.k.a. creationism - has been ruled as unconstitutional advancement of religion in public schools by Federal court.
406. 2004 wasn't as biased to fundamentalist Christians.
407. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
408. Again, adding creationism to the mix renders the standard inferior.
- Evolution as described by Darwin is fundamental in understanding our world. Intelligent design is
409. ridiculous. If parents want to teach their kid the god started the big bang fine but teachers can not teach that we all descended from the animals on a boat when the world flooded. The terms evolution and evolve need to stay in Arizona's Science Standards.
410. Current standards support true scientific thinking
411. We need to teach the theory of evolution for the
412. Absolutely contributes to the watering down of the standard. VOCABULARY is essential. The vocab word EVOLUTION is essential to developing a basic understanding of biology.
- Disgusted that Douglas is trying to eliminate evolution, something scientifically proven to exist. Her
413. individual religious beliefs should not be the basis for the science standards our children should be learning.
- As stated education must remain secular at all times. Science and evolution existed for millions of
414. years and continue to this day. The Earth is but a pimple in the universe. All the plethora of religions on Earth are man made fantasies. The are a private and personal thing that some people want to believe in. Education must remain secular. You can teach intelligent design in Sunday schools. Any religion can teach their stuff in their congregations NOT SCHOOLS.
415. You need to get more qualified stakeholders making these standards.
416. I have commented above and am upset that the Education Department wants to change science standards that remove evolution from the curriculum.
- Children need to learn science, not religion, in science classes. This means that if our kids are going
417. to compete in the world economy they must understand evolution and the scientific method of critical thought and experimentation. Don't leave our kids behind. Creationism belongs in church.
- You can't force religious beliefs in public education. Creationism is not grounded in science and has no
418. part in a science curriculum.
- The teaching of it goes against freedom of religion. You are only inciting backlash and disrespect on
- the part of students who believe differently. Science is based on observation, not conjecture.
419. Evolution is fact.
420. There is no need to de-emphasize evolution.
- Creationism has no place in our classrooms. Evolution is fundamental to understanding of science,
421. medicine, and a variety of related fields. If anyone attempts to tell my child otherwise in her Public School, they will soon be listening to me.
- Not really. The draft of the 2018 science standards are good in that they appear to incorporate
422. information from the Framework for K-12 Science Education, but they are poor standards compared to the Next Generation Science Standards. I would prefer the 2004 Science Standards for their appropriate treatment of topics like evolution, climate change, and the Big Bang Theory. Bring back the science and ADD more rigor!
423. It's inappropriate to remove references to evolution.
424. The words EVOLUTION and EVOLVE MUST NOT BE DELETED from the Science Standards of Arizona's public schools.
425. These changes are appalling and not based on actual science.
426. The theory of evolution should NOT be excluded or minimized in this current draft. The theory of



- evolution is an essential concept for students to understand. The theory of evolution is widely accepted by the scientific community and adding other theories such as "intelligent design" only creates confusion and doubt and allows religious theories to contaminate science.
427. Some of the changes are a step backwards in time by replacing accepted scientific knowledge (evolution) with religious opinion (intelligent design). This is an attempt to bring religion into the classroom. This is the type of backward thinking that gives Arizona schools such a negative perception nationwide and keeps potential business and employees from considering moving to Arizona.
428. Compared to other states, the children of Arizona are not learning the process of science effectively. You should consider your students' ability to compete academically and professionally in the future with their peers receiving a better curriculum elsewhere.
429. Evolutionary Biology is being removed.
430. The 2004 standards recognizes that evolution through natural selection is a major, evidence supported theory in science (and if you think a theory is a wobbly hypothesis, then you don't understand how science really works). This draft casts doubt on the science of evolution, which has withstood the rigorous test of science throughout many decades, opening the science curriculum to other hypotheses that do not have science based evidence to support them.
431. separation of church and state - remember learning that !
432. Evolution is critical to several sciences: biology, geography, etc. It is important that Arizona students learn without interference from religious beliefs. Hence, I find the omission of "evolution" to be without merit.
433. This is not a science education without evolution. Evolution is based on scientific facts and is critical to a science education.
434. Continue to teach evolution. Do not remove it to teach creationism.
435. Please, science based education only. No to intelligent design.
436. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
437. Please do not remove to concept of evolution from state teaching standards.
438. The re-write is NOT an improvement to the 2004 standard. Please restore the stanadards to the orginal content and form. Religion is not science. The Key Concept column is odd. As mentioned above why does science have the column but all references to content in the ELA and Math were removed.
439. I do understand that the 'old' standards are written with low rigor and understanding, they are very basic. They are straight to the point, which helps a teacher when planning. The new ones are hard to follow and all over the place. There is topics in kinder and then in second grade and then back to 5th grade.
440. The term "evolution" was removed in the Draft Standards.
441. This creeps toward only representing religious beliefs about the earth's creation!
442. I repeat: The tenets of scientific method are based on what has proven to be true. We have DNA, we have fossils, we have hard evidence to support what we teach in science. We need to always promote inquiry, but we also need NOT to disregard what we have found through rigor and evidence. Creationism, intelligence design are beliefs and should not find their way into science. Somewhere else, maybe, but not science. Downplaying evolution and designating it a theory without validating its scientific credibility runs counter to what defines science.
443. I see more of the same. If they truly want to create better science standards, look to the north of us to Utah and how their Department of Education has set up their standards.
444. Changes in language about evolution opens the door to bringing religious or other belief systems into a course of study based on inquiry and evidence, the opposite of that course of study. Clearly, these standards take a backward step into 1804, not 2004.
445. I cannot see how these standards can be broken down into classes that students will have mastered in 3 years of high school science.
446. Excluding the word "evolution" and references to it is abominable!
447. Not having climate change and global warming is horrible and not teaching our children. Not teaching evolution is takin steps backwards
448. See above

449. The removal of Newton's Laws of Motion and the Periodic Table is very upsetting.  
The decision to remove the topic of evolution from standard curriculum is an extremely irresponsible and dangerous decision which will impact many future careers, giving the children of Arizona a lesser chance at succeeding in a variety of biological, chemistry based, scientific or geological careers.
450. Children in Arizona desperately need a level playing field with the rest of the nation; which means a more comprehensive standard, not a lesser one.
451. Removing any wording as it relates to evolution is doing a great disservice to the students of Arizona. Moving toward religious mythology, which is clearly what is happening here, is moronic.  
There are significant, curious omissions and ambiguous turns of phrase in the draft standards as compared to the current standards. The big bang theory and evolution seem to have received special treatment in this regard. This is curious since these concepts are so central to understanding cosmology and biology. Such a practice renders the objectivity of the standards suspect.
452. Leaving out evolution. Surely you jest?
453. Do NOT strike out references to evolution and evolve, we absolutely need all students to understand the theory of evolution - it is critical to understanding many more fields of study. Leave the teaching of religious beliefs to the parents at home and churches. Thank you!
454. The way the 2004 standards are in regards to what content teaches the curriculum is better. Spiraling all these concepts makes it worse than our old standards.
455. I feel the changes are promoted to reflect a current (and hopefully short-lived nod) to the religious right.
456. The teaching of evolution should not be eliminated from the standards.
457. The addition of practices and crosscutting concepts, as well as the focus on big ideas, is an improvement.
458. Removing evolution as fact is wrong.  
Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.  
  
The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.
460. The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.  
  
The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.
461. As noted above, the current standards downplay scientific facts in such a way to call into question the competency of whoever rewrote the standards.  
EVOLUTION is the accepted scientific theory that is the foundation of understanding the entire living world. redefining or removing EVOLUTION from the educational curriculum is utterly unacceptable. the state of arizona should not teach children some re-branded religious concept. there are exactly ZERO credible researchers using creationism as the basis for evolutionary research. this nonsense has been beaten in the courts and proven to be an unacceptable alternative to scientifically-based EVOLUTIONARY THEORY. please get with the 21st century where Darwin's theory of evolution has been the accepted scientific theory for ONE HUNDRED YEARS. let's stick to biology in the science standards. leave the "debate" over god/s and creationism for theology or philosophy class.
462. It is clear that we must focus more on the process of science, both to teach what science is, and to get students to actually remember facts. Student-centered and project-based learning is key, as is arguing from evidence. These elements in the new standards are clear improvements.
463. I must say that I find the older standards 'strands' easier to read, e.g. page xvi on 'Life science'.
464. The DRAFT is a major step backwards. Diana Douglas doesn't deserve to be in charge of our children's education.
465. Little has changed. Scientific advances have grown in leaps and bounds over the last 14 years.

- Instead of adding in new information, but the goal of this seems to be simply gutting the idea of evolution
- This organization will allow teachers the time to teach standards at a deeper level and further challenge students to integrate scientific literacy into grade level content.
466. However, including a vocabulary list may mislead teachers into teaching science based on vocabulary rather than through the three dimensional framework.
467. Evolution has a much more central place in the 2004 standards which accurately reflect its importance as the basis of ALL modern biology.
468. By not specifically mentioning Charles Darwin theory of evolution and making it part of the core curriculum, you are purposely opening the door for the injection of religious believes that hold no scientific basis.
469. The backstepping away from teaching evolution is a concern. The change in the standards for teaching evolution are a step backwards and don't reflect the state of the science. Backstepping away from evolution will hurt the state and business in the state especially in the biological tech and related industries.
470. Shorter and less ponderous.
471. The changes that the Department of Education made to pages 4, 42, 43 and 69 of the draft science standards regarding the teaching of evolution apparently seek to either avoid the word "evolution" altogether, or to suggest that it is not a scientific fact — which it is. Education in public schools should reflect truth and not cater to religious ideologies. Please reverse these changes.
472. The new draft seems to incorporate religious studies in place of science in the public schools. Religious studies belong in the church not in our schools.
473. At least in the 2004 draft, the scientific method is mentioned. Nothing of the kind is in the new draft. How is that we want to educate our workforce and prepare our citizens for the technological and scientific society of the future ( I mean next 5 years!)
474. EVOLUTION is NOT a theory. It is a fact, proved by scientists around the world many times over. Stop trying to put your religious beliefs in our school system. Keep the wording regarding evolution, the big bang theory in our kids curriculum. Arizona schools are already behind the nation as it is. Do you want our kids to be laughed out of college science programs??
475. As above, there is no requirement to teach evolution in the new proposed standards.
476. The current (2004) Science Standards include references to evolution. The DRAFT should do the same, reinstating the word "evolution" throughout -- and not describing it as a "theory."
477. Old standard on pg 40 discussed "the scientific principles and processes involved in biological evolution". New standard gives only 1 sentence "L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms". So evolution has been downgraded to a theory and neglects the scientific principles and processes. Evolution is a fact, not a theory.
478. The addition of a column of "key concepts" to the standards' detail are essentially prescribing a performance objective (PO), similar to the 2004 standards. The addition of the key concepts column derails the objective of the Science Standards Committee so much that if they are kept in the final version, you will have wasted the time of the entire committee.
479. Schools should teach science, reason, logic and critical thinking. Evolution is bedrock science based on verifiable evidence. Creationism and intelligent? design are based on mythology and have no supporting evidence. Diluting evolution in science is being proposed to support superstitious individuals supernatural beliefs.
480. Because of how evolution is treated.
481. The Department of Education's changes to the draft science standards disappointingly appear to weaken the standards' emphasis on evolution as the bedrock of biological science. The theory of evolution is as central to modern biology as the germ theory is to modern medicine. Arizona public school science classes should help the state's youth overcome ignorant anti-science beliefs, not cater to them.
482. These standards do not reflect the important, foundational role that evolution plays in driving biological systems. Basic evolutionary concepts, like natural selection and speciation provide the foundation for all of modern biology and need to be more clearly highlighted in these standards.
483. Evolution, not intelligent design, is based in science. Science should be taught in science classes.
484. YOUR MISSING BASIC SCIENCE WHICH INCLUDES CLIMATE CHANGE AND OUR PART IN IT AND EVOLUTION!

485. Comply with scientific fact.  
The term evolution should remain in place as written in the 2004 standards. You are going backward,
486. not forward. Intelligent Design (Creationism) should not be taught in public schools. What part of the first amendment Establishment Clause do you not understand?  
These revisions seem to be unnecessary and politically motivated. They seem to eliminate aspects of
487. widely accepted scientific theory to appease a political faction or group. Intelligent design is not a scientific theory, it is a religious belief.
488. Because these are based on NGSS they are better than 2004, although the alignment by grade level could be improved.
489. Definitely support teaching evolution as a theory  
I disagree with the removal of the words evolution and evolve from the standards. I do not believe
490. whether or not evolution is taught should be left to individual teachers. Furthermore, Intelligent Design is a religious idea, not scientific. I reject the inclusion of religious instruction in public schools.  
While I understand this is a draft, I'm quite distressed about the language contained therein with
491. respect to Intelligent Design. I'm not comfortable with anything but SCIENCE being taught in SCIENCE class. Intelligent Design is just another cover for the teaching of religion in schools.  
The new draft is certainly an improvement except in areas such as evolution (it is no longer a
492. theory)and when you imply that something must have both positive and negative effects. The Scientific Method was never a "linear process" and going from a hypothesis to a conclusion is never linear, except in the minds of non-scientists.
493. There is no Biology without an understanding of Evolution
494. You are not legally allowed to impose your religious viewpoints on children in my state. A high functioning moral society thrives on diversity, not indoctrination.
495. You took out evolution in favor of religion. Enough said. We're teaching science here. Not theology. Not science that doesn't disagree with your bible. Science.  
Evolution is the basis of scientific thought.  
the undermining of the science is insulting.  
the proposed changes encourage the re-branded religious doctrine of Creationism and the intelligent
496. Design myth.  
the fossil record is clear,as are your attempts to demean science at the foot of religious indoctrination.Yoiu shoiuld be ashamed of yourselves!  
I find the wording of L4 Evolution on page 78 unacceptable. The theory of evolution is not a belief
497. system, it is science and should be worded as such. Creationist/religious belief systems, no matter how slight the influence have no place in our schools.
498. Support science.  
Religious bias does not belong in public education standards. Keep religion in the home and church. Separation of church, religious sentiments, and superstition from science teaching must be
499. maintained, otherwise anyone can teach anything, including cultist ideas, and call it science. Introducing beliefs that are not verifiable under the scientific method will weaken science understanding and research.
500. I would expect a stronger connection to NGSS.
501. Scientific theories need to remain in the new standards.  
As an engineer and science advocate I strongly disagree with the watering down of Evolution and its
502. importance in several branches of science. We should never allow openings for teaching supernatural models to be taught into public education.  
I am horrified that religious creationist garbage is being inserted into curriculum by a religious zealot.
503. We do not want to become more uneducated as a nation. Intelligent design has no place in a public school curriculum
504. Teach your BS about creationism somewhere else...
505. Old version was easier to see k-12 progression of standards in charts.
506. It is not an "improvement" to remove Evolution, this takes Arizona right back to the dark ages.
507. Please let scientists write it without bureaucratic revision! Arizona public school students deserve to understand a science as the science community does.
508. As a physician, I understand the importance of evolution should not be minimized, for such

- information is critical for the advancement of medicine and other sciences.
509. Intelligent design is not science, it has no place in any science classroom.
510. Removing the teaching of evolution from the curriculum is misguided.
511. This draft is worse. What is happening in this State? Why would the curriculum look to roll back science? That is preposterous. Does Arizona want to continue its low ratings on education compared to other states? This is not helping Arizona to succeed on the education platform.
512. This is a MASSIVE step back and will absolutely rob Arizona's youth a fighting chance at true scientific understanding.
513. See all comments above
514. I think the 2004 standards are easier to read and understand than the proposed draft. They are more concise and user-friendly.
515. Intelligent design is a religious propaganda not science. Remove it from this standard
516. Draft of 2018 science standards are too focused on how to use science for economic gain. For example, the focus in physical sciences on turning raw materials into fuel, tools, or some other form of product is not science, its economics.
517. It needs true science rigor included. Teach evolution because science proves it to be true. Religion is based on traditions and culture. Perhaps as an elective or unit within civics classes, it could be taught. However, within science class, science should be taught. Even the science that makes you feel weird.
518. Use the term evolution. This is science!
519. Removing the word evolution in some areas and referencing it as theory is wholly and completely unacceptable. This cuts against globally accepted concepts. Introducing the concept of creationism in any form in our public schools has been determined to be unconstitutional and violates the properly mandated separation of church and state. This cannot and will not be tolerated.
520. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
521. Teaching creationism in school is an unconstitutional endorsement of religion in tax payer funded public schools. Any effort to introduce this into school curriculum will be met with strong opposition.
522. Evolution is taught the way it should be in the 2004 draft. There's none of that wishy-washy language that makes it seem as though it's not a fact as seen in the 2018 draft.
523. Adding and maintaining teaching Evolution needs to be continued.
524. Evolution needs to be taught in schools--it is overwhelmingly supported by evidence and is a core concept for any biological field. Removing this from AZ Standards further sets our state back when it comes to education.
525. The 2004 standard includes in Strand 4 - Life Science: "Understand the scientific principles and processes involved in biological evolution".
526. Evolution a geology need to be taught as they are understood by modern science, and not as a fundamentalists Christian believes they should be taught.
527. I strongly disagree with the changes you have made that remove the science of evolution. Our students will grow by learning science topics that have been proven through science instead of beliefs of the religious community. These beliefs are just that they are not proven by any scientist. Lets make sure our students can grow as learns.
528. How are ideological changes appropriate in state standards? How are these standards creating students who will be knowledgable, and therefore competitive on a global stage? Shameful! Evolution is the best theory scientists have. It is widely accepted in the secular standards and science community. Should we stop teaching plate tectonics, genetics and earth layers because they are theoretical and not law? Throughout history religious believers have been able to separate the discipline of science and their own belief structure. Why is Arizona willing to move backwards? Inequity in education! Shameful!
529. Removing evolution is unacceptable.
530. Physics in the 7th grade will NOT be an improvement to physics in the 8th grade.
531. I object to the replacement of the term "evolution" with "biological diversity". I believe the government, especially as related to education, should maintain the separation of church and religious theories and the state. It appears that the changes are religious based and not based on science.



532. Science should only teach scientific theories based on science. We need to leave religion to the home and church. It has NO PLACE in our publicly funded schools!
533. You can not have an appropriate level of science education with evolution. I am no opposed to the standards being revised, but this revision must be done with SCIENCE in mind. Deleting evolution is NOT scientific. Facts are true whether or not you believe in them.
534. It is unacceptable to add curriculum on "intelligent design" - which is NOT a scientific theory. It's is a religious belief and has no place being taught in public schools, Where separation of church and state apply. Further - deleting reference to evolution, which is in fact a scientific theory, is unconscionable.  
Five words:  
  
Separation.  
535. Of.  
Church.  
And.  
State.
536. Going backwards is never an improvement.
537. Facts are facts, teach science in the schools and leave religion at home.
538. Keep intelligent design out of science
539. Evolution is necessary. You can't take science out of science curriculum.
540. There should be discussion of evolution and no discussion whatsoever about intelligent design or other non science based beliefs.
541. Too DISORGANIZED. I do not like, as a science teacher, that we are dismantling sciences and turning our science education in Arizona into INTEGRATED SCIENCE. We can't just throw material out there and say that we've covered everything. Curriculum needs to make sense!
542. The changing of how evolution and the Big Bang represented in the standards is a disservice to intellectual rigor of Arizonans. Without using the proper diction, this opens to door to validating teaching of outdated hypotheses, factually fragmented ideas, or mistruths. This is embarrassing.  
Diane Douglas wants to remove evolution from AZ classrooms, which is setting them up for failure. She says that it isn't proven science, because it's only a theory. Other theories taught in science classrooms and accepted by the wide majority of scientists (like evolution) are: Cell Theory, Tectonic Plate Theory, Atomic Theory, and Theory of Matter & Energy. I don't see any of these getting attacked in the new standards? These new standards are biased, and as a future science teacher I am incredibly furious with this new draft. As a preservice education student, I will not be teaching in Arizona if these standards are put in place.
543. Very upset to hear that creationism/intelligent design is under consideration for this curriculum. Please keep religious theories to churches and maintain scientific standards in our classroom
544. No comment
545. The wording of this draft does not include some of the language in the NGSS.  
Arizona students cannot be expected to compete on a world stage if science is dumbed down to meet the comfort zone of uneducated people. The ability to analyze data is core. Also, there is a difference
546. between core and essential, the later being subjective and vulnerable to the whims of those who would twist information to suit their point of view. Core is immutable. Evolution is not some dirty word. It is a body of evidence.
547. Addition of engineering was imperative. This is a more comprehensive and thoughtful set of standards.
548. As an individual that came to Az in the 90s for a high tech job and to raise my kids in an area that encourages high tech science fields, I am simply appalled at the current rewrite of evolution within this draft, especially considering this was not rewritten by science teachers!
549. Intelligent design is a religious concept not a scientific one and does not belong and our science standards. Our children need to learn about the theory of evolution.
550. See comment #9
551. The previous draft had stronger wording about the validity of evolutionary theory, which is better. I have a PhD in biomedical science and I can attest to the fact that the previous wording is more aligned with a foundation that would prepare students for a career in life sciences.
552. Evolution is the underpinnings of modern biology. To remove it opens the door to non-scientific views of the world and pretends that Science is based on opinion, not fact.
- 553.



- I strongly disagree with the attempt to "water down" the universally accepted scientifically supported view on evolution. I strongly disagree with the attempt to "water down" the universally accepted scientifically supported view on the Big Bang origin and expansion of the universe. These are both theories that are founded on real scientific methods and observations and not on one particular religious mythology.
554. scientifically supported view on the Big Bang origin and expansion of the universe. These are both theories that are founded on real scientific methods and observations and not on one particular religious mythology.
555. See first comment
556. De-emphasis of evolution does not advance science education. There is no scientific controversy about evolution.
557. If you are going to include Intelligent Design, then you must also include the Flying Spaghetti Monster. Please refer to the letter to the Kansas Board from Bobby Henderson.
558. These changes would be detrimental to the greater success of Arizona students and the 2004 standards should remain in place.
- I read the entire draft document - overall I think the changes made and additions make sense and seek to clarify the standards. I have two issues with the changes. First, you have a typo on page 29: in the first paragraph you say "starts" when it should read "stars". Second, I do not think the removal of the term "evolution" is an improvement because it is doing the students a disservice. To not use the term "evolution" in the standards tells the teachers they don't need to use it either - this causes our students to be underprepared when they go to their next level of education. "Biological diversity" and "evolution" are NOT the same thing, so your use of the former in place of the latter is reprehensible and shortsighted. You are ensuring that our students do not receive the proper life sciences education they need to successfully navigate the next levels of education as the rest of the country operates.
559. the term "evolution" in the standards tells the teachers they don't need to use it either - this causes our students to be underprepared when they go to their next level of education. "Biological diversity" and "evolution" are NOT the same thing, so your use of the former in place of the latter is reprehensible and shortsighted. You are ensuring that our students do not receive the proper life sciences education they need to successfully navigate the next levels of education as the rest of the country operates.
560. This draft is an insult to science education, as well as the future of Arizona. We should not be teaching religious doctrine alongside scientific theories such as evolution.
561. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.
- This draft represents the attempt to undermine the established scientific concept of evolution by injecting/replacing language based on religious theory. This deprives AZ students of correct scientific information and will place them at a disadvantage in college. The United States is based upon the separation of church and state as an overall guiding principle. Religious theories have no place in public school education.
562. injecting/replacing language based on religious theory. This deprives AZ students of correct scientific information and will place them at a disadvantage in college. The United States is based upon the separation of church and state as an overall guiding principle. Religious theories have no place in public school education.
563. **[No Answer Entered]**
564. While the 2004 standards are not rigorous enough, these new standards are even less rigorous and too open to interpretation.
- I am also highly opposed to the language that states that the science and engineering practices were formerly known as the scientific method. The scientific method still exists. The SEPs are skills that students use when following the scientific method. This is an inaccuracy that is not appropriate.
565. formerly known as the scientific method. The scientific method still exists. The SEPs are skills that students use when following the scientific method. This is an inaccuracy that is not appropriate.
566. Keep personal ideologies out of content areas!
567. What kind of draft would include science teaching based on religious beliefs?
568. New standard appears to discount evolution and push creationism.
569. This is not science it is imposing religious beliefs on our children.
- This draft replaces "evolution" with "biological diversity" or eliminates "evolution" in various places. This draft is trying to remove the teaching of the process of evolution, which is learned by studying evolutionary theory, from the curriculum. This is not acceptable. The former draft by default was a drastic improvement on this one, and not the other way around.
570. evolutionary theory, from the curriculum. This is not acceptable. The former draft by default was a drastic improvement on this one, and not the other way around.
571. Like 2004 standards.
572. Science standards should encourage critical thinking and evaluation of the evidence relating to evolution.
573. The current Standards and the Draft should include more material on rocks and minerals.
574. Quite opposite, it present disturbing trend of hindering advanced of our students in science.
575. STRONGLY DISAGREE
576. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
577. I particularly disagree with some of the phrasing in the Life Sciences standards portion of the Draft

Science Standards. What I am concerned about is the language in section L4 on pages 4, 20, 32, 46, and 70 that uses the phrase "the theory of evolution seeks to make clear the unity and diversity of living and extinct organisms" Since there is a large amount of scientific data available that supports evolution as a valid scientific concept (from Charles Darwin to Stephen J. Gould, and others) I would suggest that you remove "the theory of" and "seeks to make clear" and insert language that is more in line with the sentence in the 2004 Science Standards that states "The unity and diversity of organisms, living and extinct, is the result of evolution" (part L4, page 79) or just keep the language the way that it is currently: "Evolution seeks to make clear the unity and diversity of living and extinct organisms". Another comment I have also concerns the Draft L4 statement on page 79. The proposed sentence read: "Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive in certain conditions" Again, I think natural selection has been proven by the scientific method to be a valid concept, and so I don't think the phrase "are believed to" needs to be included there. I have a couple of other comments on the Draft: In the sections that state "Applications of science often have both positive and negative ethical, social, economic, and political implications" I would argue that there is not a need to include "both positive and negative" in that sentence. By leaving the sentence the way it currently is, there is plenty of room left open for whatever discussions teachers and/or classrooms might decide to have around the topic. And one last comment on the language of part U3 on page 4 under the Core Ideas for Using Science. Instead of saying "The knowledge produced by science is used in engineering and technologies to create products", couldn't we reach for a higher purpose in describing science? Maybe more along the lines of what the IEEE uses as their slogan: "Advancing technology for humanity"? Something that would encompass the beauty and wonder of discovery and the benefit to all mankind from the teaching, creating and implementing that goes into this beautiful discipline? I hope you will take my comments into consideration. Thank you for allowing me to share them.

578. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
579. Superintendent Diane Douglas has removed key scientific concepts from the AZ Science Standards in a misguided attempt to inject her personal religious views into public education for all Arizonans. Standards relating to Evolution and The origin of the universe, specifically the Big Bang, have been corrupted or removed. She should be ashamed.
580. The elimination of 'evolution' is a disgrace - attempting to provide some sort of legitimacy to religious ideas, and a false 'intelligent design' - pretending it's not creationism is wrong. The word 'theory' in regards to evolution is not the definition of theory as laymen use the word... Unless you are going to refute THEORY of gravity or relativity ? So, no need for a sneaky backdoor to introduce our school children to fantasy Bible stories to explain species and origin of life. Keep bible stories out of our schools & Science onward !
581. Omitting the terms evolution and "big bang" would place our state on the wrong side of science.
582. Evolution is a proven scientific fact. To imply that it isn't is just not the truth. It is terrible to not teach our children this established fact of science.
583. I like that we are including more engineering standards and examples.
584. While improvements have been made in other areas, the text regarding evolution inappropriately conveys a level of distrust in evolution that is NOT present in the scientific community. It is up to individuals, not state science education standards, to formulate how their faith is concordant with rigorously developed scientific theories.
585. It is my opinion that the "red line" changes made after science professionals created the original draft have actually weakened the text over previous text books.
586. It is imperative that Arizona's students learn and understand the theory of evolution and should not miss out on important scientific education because of political meddling.
587. Some changes are welcome. However, you have to teach children the vocabulary scientists use, in order to be competitive. You must include evolution.
588. The latest edits to evolution are not an improvement. There is no reason to reintroduce the fact that evolution is a theory except to exploit the differences between the common and scientific understandings of the word "theory." Furthermore, adding that evolution "seeks to" explain biological concepts is a dishonest attempt to hide the outstanding success of evolutionary theory.
589. This draft is the worst. Innovation and religious beliefs are two different things.
590. Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.

- Please don't avoid education on evolution.
- I appreciate the larger conceptual connection to the next generation science standards such as Science and Engineering Practices, disciplinary core ideas, and crosscutting concepts. Though the specificity of disciplinary core ideas seems to encourage a teaching-to-the test approach to education, which I do not think is in the best interest of young people.
591. The original structure, before internal review, of the standards presents information in a clear and detailed way with more of a focus on the goal of science rather than a checklist of skills.
592. Are you kidding? Removing Evolution from Science education is criminal.
593. Creation or Intelligent Design as some people like to state has no place in classrooms. Teachers should not be teaching this subject as it has no scientific basis. I have taught science in the classroom and this is not a direction that should be taken. Keep religion out of public schools.
594. The Draft is remarkably inferior compared to the current standards. The current standards are valid, whereas the Draft standards are the dying wheezes of the Christian Fundamentalist Baby Boomer generation, as channeled through Diane Douglas. The US Court system has refuted intelligent design, which should have told Diane Douglas to give up the ghost a long time ago. She clearly drank so much of her own proverbial Kool-Aid she is now touting it as a viable replacement for unadulterated water.
595. The new draft will further students understanding of exploring and critically thinking.
596. Not teaching evolution? I am horrified. Arizona children are already far behind. And we're to make them ignorant of scientific facts? Religious beliefs can stand alongside scientific facts without a problem.
597. This draft is disrespectful to science. Religion does not belong in public school standards. That's what Sunday school is for.
598. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
599. AZ is not teaching proper science.
600. The simple removal of evolution makes this document a joke.
601. While I think the standards have needed to be revisited for some time, these changes are too drastic and rushed. They should wait for at least another school year to allow schools adequate time to prepare for implementation and state for making changes.
602. Creationism should only be taught in Sunday School, not in a government funded program of any sort.
603. This is the wrong direction. We need students to understand more not less about the world.
604. There is no need to replace "evolution" in the teaching of science. It means "changes over time" . Why does the word "evolution" need to be replaced? It is ludicrous!
605. The relative merits and rigor of different approaches to discovering new knowledge are not adequately addressed. For instance, students will not come away with a strong, personal understanding of how and why observational data has different merits and limitations than experimental data. This is critical to EVERY domain of knowledge, yet is severely lacking in these standards. Also, established knowledge is referred to in the standards, misleadingly, as theories. Not only that, but also the difference between colloquial meaning and scientific meaning of the terms fact and theory are not addressed, and no personal understanding and experience of the differences between those are required for students.
606. The future of our economy and nation will rest on our children having the rigor to design quality experiments, have experience conducting primary research at a young age, and firsthand, hands-on experience with currently cutting edge technologies. Where are the requirements for this?
607. The 2004 is not impressive that is true but the new standard is just a publicity stunt. Someone got smart and organized it slightly better with smart graphics etc. However, it's really not too different...the wording is too open and vague and can easily be interpreted to the point that there will be large variance from classroom to classroom on how much a student will learn.
608. This is moving our children's education towards denying evolution. Evolution has scientific basis. This religious right woman trying to pass this crap off as science education should be fired.
609. I disagree with the fact that the word "evolution" has been removed from the draft. It is incorrect

science to attempt to ignore or discredit evolution. Any other ideas on this subject can only be opinions. Everyone is entitled to have an opinion, but it is wrong to insert it into The science standards for our state. It would be a step backwards for public education in the state of Arizona. Please Use the version that was recommended by the 100 or so educators who I think are highly regarded professionals in their fields that includes the word evolution.

610. I have not had time to review the 2004 standards
611. The current standards are fine. They are in line with the majority of state science standards across the country.
612. I think it's horrifying that the state is trying to purge evolution from our science standards. Religious beliefs are the domain of churches, not our schools. And evolution is only a theory to those that don't truly believe or understand science.
613. No comment on changes
614. I think Arizona's science standards are sufficient. I feel like there are too many standards in the current draft of standards and I am not sure if I can subsequently teach all of them to the rigor and depth that is expected before state testing.
615. Evolution should be taught, clearly, in our schools. Anything otherwise is a violation of the separation of church and state.
616. This is a huge step backward. I've reviewed both, and the former is clearer and gives evolution the attention it is due.
617. The standards 8.L4U2.12 & HS.L4U3.31 take Arizona's Science standards to a lower level that encourages the teaching of alternate, unproven theories that have no place in public education and will devalue our science curriculum.
618. Agree with all the new and updates science standards except the inclusion of intelligent design. The ideology of intelligent design does not belong in the science standards
619. You can't improve science standards by including religious beliefs.
620. While I believe there are improvements, it also falls short from the 2004 draft. The current draft encourages more critical thinking skills, which is fantastic, but it misses a significant amount of foundational information that was present in the 2004 document.
621. This isn't science!!
622. We need evolution taught in AZ.
623. I prefer the 2004 standards to those editorial changes made by the administrator.
624. I have some concerns about the coverage of evolution in the current draft standards, and I have deep concerns about whether these standards as they stand are actionable in the classroom.
625. We used to have standards. These aren't standards. You are failing our students and our state with this poppycock.
626. The elimination and downplaying of standards around teaching evolution makes this document laughable and extremely harmful.
627. The adjustments to the mention of evolution are intolerable and unscientific.
628. Any modern scientific standards that ignore major conclusions from scientists about climate change, evolution, and big bang cosmology are not sufficient science standards. These are the conclusive results of the research from the scientific community and cannot be simply ignored because politicians disagree with the scientific findings. It is not their place to choose these standards. The standards should be chosen by qualified individuals with science degrees and backgrounds.
629. The present draft is a backwards step if we are removing analytical and hard science solely in favor of inserting the fantastical beliefs in a specific mythological story instead at the behest of one dingbat.
630. I could get used to the new organization. I do like that the process and content standards have been combined, which may help teachers include the processes in more lessons.
631. See above
632. This is a huge improvement over past standards that separate process from content and reduce big ideas to small facts. I especially like that the draft standards explicitly make the shift from teaching the scientific method to teaching scientific practices.
633. Please, as a physician who works in cancer and cancer research, we rely heavily on having students prepared in the rigors of science inquiry, hypothesis formation, unbiased testing, and even yes evolution. Understanding how DNA and RNA change in every species randomly and how those

changes affect all species (and humans!) in a very negative way (think cancer) and very rarely in a positive way (think bacteria becoming resistant to antibiotics) are all basic understanding on evolution (how species evolve). All science is based not on HAVING the truth, but getting closer to it. No where in my learning did anyone suggest that evolution meant there was no God: we just learned how the molecular changes have effected the organisms over time. We don't debate evolution in the scientific fields; we all see it happening. Those who also believe in religion are treated with respect, but even those see the research and understand its vital importance to understanding all of life. Please allow the scientific fields to continue this vital work and do not impose belief systems on what is continually being studied, learned about, and thought about critically. It is vital to our fields in human medicine, as difficult as that is to see by some.

634. 2004 standards are superior and provide for a better framework to teach and learn science.
635. Removal/replacement/minimizing evolution is completely unacceptable.
- I strongly object to the removal of the generally accepted and used phrase "natural selection" from the 2018 DRAFT. (5.L3U2.10) and the elimination in most standards of the word "evolution." (HS.L4U2.31 and HS+B.L4U2.20) Eliminating the word "evolution", or recategorizing it as the "theory of evolution" displays disregard for commonly accepted scientific terminology, shows poor rigor by not acquainting our students with accepted phrases, and puts Arizona students at a disadvantage when proceeding to higher education.
636. Also, Space Science standards (HS.E2U2.17) eliminate references to the Big Bang theory, the dominant and scientifically accepted explanation for the origin o four known universe. The standards display poor rigor by eliminating reference to this theory.
- I am vehemently opposed to making the proposed changes regarding removing or qualifying the subject of evolution. In no way should this be considered and frankly it makes me consider moving out of this state should this actually occur.
637. Again, this is the wrong direction. Theology has no place in science. Be prepared for a long fight from the community
638. The new standards will be great as long as Diane Douglas stays out of the way of the hard work that teachers have put in.
639. I strongly disagree with the removal of some references to the theory of evolution, as well as the weakening of statements which involve the theory of evolution. This DRAFT is a disgrace for science education and reflects undue influence of nonscientific and religiously biased views in its craft. Please reject the current DRAFT.
640. Delete all requirements &/or allowances to teach religious/creative/intelligent design & strictly require teaching evolution.
641. Needs to include evolution!
- I am disturbed to see references to the theory of evolution and the Big Bang theory crossed out. I am even more disturbed over reports in the media that claim there is a desire to put creationism into the standards. Religion and science are two separate topics. Creationism is not a scientific theory. You might as well just toss in the idea that a unicorn pooped out the universe.
642. There is no reason why evolution should be taken out of the standards.
- The theory of evolution needs to be taught in school. Colleges expect students understand and be educated on this subject, and so many careers. Deleting the word and using analogies is childish and immature.
643. Scientific consensus is & should always be the standard.
644. It would be better to continue with the current standards than continue in this direction.
645. Recent changes to the newest draft have none scientific approach in wording on evolution.
646. Again, evolution needs to be included in the curriculum. It cannot be ignored and overlooked.
647. Creationism has no place in public schools.
648. Same as above. The removal of teaching evolution is unacceptable.
649. Improvements in the proposed standard:
1. Proposed standard fills topical gaps between grade levels.
  2. Consistent focus on elemental cycles through most grade levels appears to be a promising way to connect standards through topics.
  3. Proposed standards may present basic, process oriented, science concepts in a more intuitive and



engaging manner for younger students.

4. Proposed standards frame high school level topics in a more applied, open-ended, and challenging manner which could appeal to a larger spectrum of learners.

5. Current standards suggest a rote pedagogical tactic.

Weaknesses in proposed standards.

1. Current standards have clearer goals for life science education and more accurate summaries of life science topics including biological evolution.

2. Current standards have more robust descriptions of climatic and surficial geologic processes.

3. Emphasis on mineral resources and technology appears to depart from current standards. Across the entire standard this emphasis appears gratuitous.

4. Current standards have a section which explicitly links standards across topics.

5. The proposed standards lack a glossary.

653. The required content covers aspects that are important to continuing science education. It is a disservice to students to wash over the titles of important scientific theories such as the Big Bang Theory and evolution. By not referring to these theories in the proper name you are reducing the common knowledge that these theories have substantial supporting evidence.

654. Removing "evolution" wording from Arizona's K-12 Science Standards is deeply troubling.

655. I would agree come closer to agreeing for the Physical and Earth Science than Life Science. The Earth Science are the best in my opinion.

656. It is a much needed improvement from the 2004 standards, as the move away from the skinny POs to richer, broader standards will support a deeper understanding and engagement in the sciences.

I am just focusing on one example. The current (2004) Science Standards deal with magnetism in an accurate way.

657. In the proposed DRAFT of the Science Standards, magnetic currents are specified as part of what fourth graders need to model and demonstrate. Is the draft referring to magnetic fields? This is just one small example, but it is inaccurate and throws into question the accuracy and rigor of the entire DRAFT.

4.P4U2.2

Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents.

Another example is the push to change how evolution is presented in this DRAFT. The current (2004) Science Standards properly present evolution without couching it as the "theory of evolution."

658. The originally draft created by science experts focused on the Science content our students need to know. Those should be revisited and re-incorporated into the final draft of the standards.

659. The original draft submitted was a great starting point without the Key Concepts, the content appears watered down and less rigorous in the last draft of the standards and because of these changes, the 2004 draft is better.

660. The original drafts without the key concepts, strike outs, and

661. Why have the words "evolution" and "natural selection" been removed from the standards? These are accurate words to describe long standing scientific ideas that should be taught to students. Making the language of science more vague is not a helpful change.

662. The only concern is stated in #11 above.

663. Attempting to remove science facts and established theories is a backwards step. A theory is not an idea. A theory needs evidence, be testable, and survive tests and scrutiny.

664. Too radical

665. Yes, SOME of the information is updated to represent current scientific knowledge. It is also NOT an improvement because terminology and concepts are not true to the scientific community. For example the term evolution is not used but the definition of it is. When students do their own research or go on to participate in the scientific community there may be confusion because we have not used the accepted terminology.

666. Focus more on the big picture, instead of learning facts.

667. The attempted removal of evolution represents an enormous step backward.

668. See 13. above. Businesses open up and move here based on having a work force that is educated, thinking and ambitious. Going to creationism and intelligent design that you favor will make Arizona



- look like a backwater state, like rural Alabama or Mississippi.
669. It is a good move for Arizona to use the NGSS as a basis of our new state standards, as these are updated based on the current understanding of science learning. However, with key parts of NGSS stripped out or altered to the point that they are misleading, these standards are not acceptable.
670. Yes, having the new standards and giving 4 big concepts is a relief compared to the old standards.
671. These new standards are even more overtly political than the ones currently in use. Hard to believe we could do any worse than we already are in terms of educating our youth, but will do just that if these standards are adopted.
672. They are a vast improvement.
673. The modernization of the science standards is a vast improvement over the 2004 document. This draft, with the inclusion of the key concepts column and vocabulary changes, marks a step backward from the 2004 standards.
674. It would seem that biological evolution is an important concept in the 2004 high school life sciences, with the material going over how many other branches of study, including chemistry, geology, and geography, all give credence to its existence. In contrast, the 2018 standards are afraid of even mentioning evolution without it being in direct relation with the word "theory." Yes, evolution is a scientific theory. So are plate tectonics and cell theory, yet these concepts are allowed to exist without being attached to the word "theory". Instances of the word "evolution" (as it relates to biology) is either stricken completely, replaced with a weakened euphemism like "biological diversity", or presented alongside the word "theory." While this is technically correct, and the standards do provide a definition of "theory" as it relates to science, I think it is clear to everyone that this is an attempt to undermine the concept of evolution by associating it heavily with the colloquial use of "theory", i.e. a guess. This is supported by the addition of weasel words like "may" to the sentence "Construct an explanation based on evidence that the process of evolution [may] result from natural selection" or "are believed to" to the phrase "[...] changes resulting from natural diversity within a species [are believed to] lead to the selection [...]". The 2004 standards make no such attempt to emphasize evolution as being "believed" or that it "may" explain changes in species. Speaking of undermining theories, the only instance of the Big Bang theory has been removed. The Big Bang theory is the current prevailing model of the expansion of our universe, so its near complete removal, replaced by the much cloudier "theories related to the scale and expansion of our universe", is also somewhat jarring.
675. Better, but why are you spending so much money when the NGSS are much better thought out and planned.
676. The DRAFT of the Science Standards is a step backwards from where we were in 2004. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
677. The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
678. It was an improvement until Supt. Douglass made ideologically-based edits. The current standards draft is worse than the 2004 standards.
679. The draft, before it was altered by ADE, is a vast improvement over the 2004 standards.
680. The current standards, while containing a certain amount of needless detail, seem easier to digest.
681. The current science standards needed much improvement to move towards a better representation of what students need to learn about science, but the current DRAFT does not achieve this.
682. The standards are heavy on Earth and Space and too light on Life Science. 4th grade students grasp biology concepts best. They struggle with concepts that are not as concrete, such as "geosphere, mesosphere....etc" The standard for 4.E1U2.6 is not developmentally appropriate for 9-10 year olds. I have been teaching 4th graders at a relatively middle class school for 15 years. The standards that students were able to learn best and keep their interest most engaged was our Ecosystems adaptations/Relationships unit. Atmospheric systems are too far removed for a 4th grader to understand. They struggle to understand weather fronts and air pressure in our current standards.
683. I am examining chiefly the current draft Internal Review, and I find it superior to the prior Standard.
684. Playing down or eliminating references to evolution are a major problem and should not be allowed in scientific education.
685. This draft does a much better job of including a brief connection of grade bands (ex: K-2) and the practices and crosscutting concepts. It also embeds more applications to thinking about human connections in science. These items were very disjointed and often left out of instruction based on the

- 2004 standards.  
With that said, I am very concerned about the ways in which engineering design, scientific theory, and applications to technology have been proposed. These items are in some cases either missing, hard to find, or represented in an inaccurate manner.
686. It is an improvement that the new draft standard utilizes components from "A Framework for K-12 Science Education", particularly crosscutting concepts and the science and engineering practices.  
Once again we see personal religious belief creeping into discussions about science.  
Yes, Evolution is a theory, Like the theory of Gravitational attraction, Quantum theory and all the other factually based scientific theories.
687. There is no "alternative theory" folks. I suggest Ms. Douglas review the record in the court case "Dover vs. Delaware" for a reminder of how transparent and ridiculous the "Intelligent Design" movement really is.
688. However, they have been changed so that they intentionally strive to MISLEAD and do not represent TRUE science. Diane Douglas SHOULD NOT BE ALLOWED to alter the standards at all!
689. No comment.
- I appreciate the effort that was put in to updating the Science Standards, but I do not feel that it represents the leading consensus of the scientific community in regards to teaching on evolution. The revisions to Core Idea L4, the introduction under 8th Grade Cause & Effect..., the 8th Grade Life Sciences Intro, section HS.L4U2.31, and section HS.E2U2.17 go to great lengths to frame evolution and the Big Bang as debatable. While these theories are contested by religious groups, they are not controversial within the scientific community. While I realize that science sometimes gets it wrong, I believe we can represent them more realistically as widely accepted, sound theories. These Standards guide public schools, not private schools, so religious teachings have little bearing on this matter. We are preparing students for further academic study in college. To note, I didn't see gravity in question, and it's a theory, too, but not one opposed by religious groups.
690. These standards are a step backwards, not forward. And I think the 2004 standards are pretty uninspired. I know, I've been teaching science for 10+ years in Arizona. Just because you put your personal thoughts (not science-based facts) into the language, you cannot stop the process of science and learning through evidence.
- The content while covering all relevant areas of science, had a conspicuous lack of the words "evolution" and "evolve". The theory of evolution, along with evolutionary science, have been standard in American public education for a very long time. The reason for this is that they are the prevalent theories in regard to the development of biological diversity on our planet. This includes the evolution over the last few hundred thousand years of our own species, as well as the diversity seen within Homo Sapiens. It has been the law since 1968 (per a Supreme Court decision) that creationism cannot be taught in public schools. While this draft does not venture that far, it is obvious that is the overall intention. By removing evolutionary theory from the states science standards, we do our children a disservice which will have negative effects on their future education. While I do follow a religion, and I support ideas such as children celebrating Christmas, saying the Prayer of Allegiance, ect. in school, I do not believe religion itself should influence education standards.
691. Less scientific!
692. Original language should remain
- It is wrong to remove all references to evolution, which is FACT based on incontrovertible scientific EVIDENCE. The changes are thinly-veiled attempts to promote religious beliefs on public education students. Federal courts have already ruled that teaching intelligent design- a.k.a. creationism- is unconstitutional advancement of religion in public schools.
693. There should be no changes to subject of evolution and creationism should be left out because it is not scientific.
694. Not an improvement. Going into the dark ages here.
695. It omits evolution.
696. I have not made this comparison.
- I find it subversive, disingenuous, and harmful to modify the clearly stated draft state science education standards submitted by a committee of qualified educators to remove the use of the word "evolution". School standards for science should be evidence based and actually prepare students for lifelong learning and understanding of the world around them in the vernacular used by institutions of higher learning. I find it offensive that the hard work of the qualified committee of educators has been diminished for political purposes.
- 700.

701. I strongly disagree with the weakening of the science of evolution in the school curriculum. Evolution is not "just a theory", but it is evidence-based science and needs to be taught to our children. The public school is not the place to interject religious beliefs, which is what this proposal will do. "Intelligent design" is not science!!
702. is definitely an upgrade.
703. Leaving out evolution and the big bang are inexcusable.
- On page 4,  
L4: "The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms." This is clearly an attempt by creationists to downplay evolution as "just a theory." Also, "Seeks to make clear" is patently false - it is undeniably clear that evolution demonstrates beyond any doubt that all life evolved from single-cell organisms.
704. Teach evolution. Evolution is science.
- Since when it is permitted for public schools to cram religion down a child's throat? You're not looking at this with an open mind. What if someone wanted to teach school kids that there was actually a third race created by 'god'? According to the Quran, 'god' made angels, humans and djinn. Shall we teach that to kids in anthropology or would you exclude it because it comes from someone else's religion?
705. Deleting the words referring to evolution serves no purposes than to misinform arizona children
706. The 2018 draft is clear about the academic goals (with the exception of life sciences/biology) and is more in line with widely accepted major goals of science education.
707. Evolution is a theory, not a law like Gravity. The new changes allow us to teach it as a theory.
708. The changes to evolution should be removed!
709. You don't improve something by returning to pre-scientific religious theorizing.
- Diane Douglas said, "What we know is true and what we believe might be true but is not proven and that's the reality." "Evolution has been an ongoing debate for almost 100 years now. There is science to back up parts of it, but not all of it." These are her "beliefs", the truth is that evolution is fact and that is how it should be taught. The purpose of teaching it as "just a theory" is to have that little bit of wiggle room it introduce doubt so that christians can then push their own beliefs on our kids.
- Many of the 6-8 standards were quite random and did not lend themselves to building strong units. All of the 7th grade standards were written at Bloom's level 1, these are more unified and help with vertical integration among middle school educators. The exception, of course, being the standards' handling of evolution. Teachers in public schools should have a clear mandate to teach evolution, because that is science.
710. Removing direct references to evolution is an affront to common sense and accepted scientific fact. Creationism and intelligent design are religious ideology masquerading as science. Teach religion as science (as apposed to teaching about religion in Social Studies classes)has absolutely no place in our public schools.
711. The exclusion of evolution and the inclusion of intelligent design is disturbing. Intelligent design is creationism. Creationism is teaching religion in public schools. Intelligent design is also bad religion, as you need it to justify faith. Intellige design is bad science as well as you use belief in something undetectable as scientific truth. Please reconsider.
712. Get rid of the Intelligent Design language.
- The dogmatic teaching of evolution as "established" science was and is outrageous  
The new standards are a good start but evolution HAS to be taught as "theory" as far as origin of life is concerned and intelligent design given as an also valid theory of the origin of life on this planet. Changes over time of planets and animals is fact but both evolution and ID can be scientifically studied Read Meyer's book "Signature in the Cell"
713. It is only an improvement in some areas
714. The standards have omitted mention off evolution, a core tenant of science. This is unconscionable.
715. Evolution is scientifically proven, not a theory. I also don't appreciate sections that outline for the "argument whether or not," rather than simply analyzing a position.
716. The changes do not represent the best science and lower the educational standard for our students. We will graduate students without a proper understanding of how the world works.
717. leaving in the scientific and evidenced based information about evolution is esstential

723. Watering down the meaning and function and importance of evolution, and missing the scientific meaning of the word "theory" is scientifically ignorant and harmful to science education.
724. The interrelationships and big ideas that organize these standards will build a better understanding of science for all students, regardless of whether or not they choose to pursue careers in science and technology related fields. All of us should be making decisions that affect our communities, our nation, and our world, based on solid science.
725. The changes that were made were improvements, up until last-minute changes were made to sentences concerning evolution and the Big Bang theory.
726. The theory of evolution has been deleted. Clearly the new draft is catering to the fringe views of the religious right and violating the principle of separation of church and state.
727. Go back to the standards developed by science educators
728. Only SCIENCE in Science class!
729. Keep the theory of evolution in the standards.
730. Proposed changes regarding evolution. One of our country's founding ideals was "Separation of Church and State". Minimizing evolutionary theory and promoting religious beliefs belongs in Sunday school, not in public funded institutions. Our children need to be taught science based on reality and facts, not "someone's" personal religious agenda.
731. These draft standards are a strong improvement over the current 2004 standards.
732. It seemed like in the 2004 standards, all of the concepts were put in a hat and a few just pulled out for each grade level without and scope and sequence between grades. The information desired to learn was good, but no direct foundation for the next grade in the subjects content. The Standards that were the "why of science" seemed to build on one another, but not the content/subject concepts.
733. Removing and altering evolution teaching standards will only serve to make Arizona students less qualified to compete with students from around the country and around the world.
734. In relation to the removal of the environmental impact.
735. This gives the facts and is accurate.
736. Language about climate change and evolution is weaker in the 2018 draft compared to accepted scientific knowledge.
- Those writing these standards should be experts in science and/or education.
737. At a minimum they should understand what the word "THEORY" means in scientific terms.
- Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
738. The theory of Evolution was replaced with Intelligent Design, a non-secular idea which does not follow the scientific process.
739. This draft eliminates basic scientific concepts such as evolution
740. Having been on both Standards Committees, what was originally presented for initial review was much better than what we produced in 2004 which focused on content standards rather than process skills. That was our task for the new standards. However, this has been most gutted in the review process by individuals who do not seem to have an understanding of scientific process.
741. This draft makes Arizona a national laughingstock, is an insult to dedicated scientists and science teachers, and is a severe threat to students.
742. It is very hard to understand.
743. In any degree it continues to promote false teachings
744. How many scientific institutions or research centers or biotech industries do you think are going to locate in Arizona when its Education Department is a joke? When your so-called standards tell teachers to teach that ignorant superstition is a responsible alternative scientific theory?
745. Politicians and religious zealots want to override accepted science.
746. Creationism has NO place in a science classroom. There is 0 evidence.
747. As described above, the substandard treatment of basic life sciences principles will reduce the

- preparedness of our students and the economic growth potential of our state.
748. Any change in curriculum de-emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self-copying DNA in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millennia is a scientific fact.
749. The deletion of the term "evolution" is a horrific watering down of the content.
750. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
751. The study of evolution must not be removed or diminished. And removal should be reinstated.
752. May have improvements in some areas I am not qualified to address, but strongly disagree with many suggested changes to life and physical science concepts, and language on core ideas (see previous comments).
753. did not review 2004
754. The lack of information in regards to evolution and climate change is appalling. Please review L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.
755. Let's be clear about the Theory of Evolution. This is not just some idea, but rather a scientific cornerstone of how we understand our planet.
756. It's a reversal to 19th century beliefs.
757. The 2004 standards were more science- and evidence-based.
758. Evolution should be present in the standards.
759. As a former 4th grade teacher (who left teaching in 2000) I find the 2004 standards easier to interpret. The older standards seem better organized and more clear cut in organization. The main improvements I see in the new standards are the 14 key concepts and the linking of science to other disciplines. I STRONGLY object to any changes in references to evolution.
760. Having been on both Standards Committees, what was originally presented for initial review was much better than what we produced in 2004 which focused on content standards rather than process skills. That was our task for the new standards. However, this has been most gutted in the review process by individuals who do not seem to have an understanding of scientific process.
761. the proposed standards incorporate the promotion of religious beliefs into public education. These are best taught separately through any number of programs OUTSIDE of Public Education.
762. Watering down the Theory of Evolution with creationists ideas is doing nothing but dumbing-down this generation of students. People with creationist beliefs have no business deciding science standards, let alone teaching the subject - this needs to be done with people who fully understand the subject - i.e. scientists. Evolution and the Big Bang are scientific theories that can be tested and measured over and over with the same results, like gravity (which is a scientific theory). Biblical creation is just a belief - nothing more, based on a Hebrew myth that was based on ancient Babylonian/Sumerian myths. Teaching creation in public schools is also unconstitutional (Edwards v. Aguillard, 482 U.S. 578 (1987)).
763. Do not take evolution out of the curriculum or manipulate it in anyway.  
They are virtually the same. The "improved" difference is in the presentation of the pdf document.
764. The document is written much better with flow charts and color coding. This does make it easier to read. But this can also be applied to the 2004 document. So I ask, what are you asking of question 14, that is improved about the 2018 draft? Is it the aesthetics of the writing or the planned teaching? Question 14 is too open ended for the context of it describing educational teachings.
765. The intentional removal of evolutionary concepts and terminology is backwards movement. Evolution is a factually established reality and a theory. Theories are as good as it gets in experimental (hypothesis testing) science. Which is the bedrock of our modern society and advanced standard of living.
766. No comment.
767. Not sure



768. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.  
The 2018 Science Standards contain changes being made/suggested by the ADE that undermine the teaching of the Theory of Evolution by attempting to convince people that Creationism aka Intelligent Design (ID) is also a theory. ID is not a theory, it is a religious belief. Religious beliefs and teaching of those beliefs should be left in the churches. SCIENCE theories, scientific studies, scientific facts should
769. be taught in public schools by trained teachers, not preachers. Religious teachings do not belong in our public schools. If I want my child to learn about Creationism/Intelligent Design, then I will send my child to church and church camp. My tax dollars pay for public education, not religious schooling. I do not tell religious institutions what to teach or how to pray or what to believe. Separation of Church and State is a Constitutional Law of this land -- stop trying to sneak religion into state schools.  
The draft written by the committees was a huge improvement. I so wanted to give this a strongly agree, but ADE twisting the meaning of scientific theory, watering down language related to
770. evolution, earth and space science, and other specific standards makes this draft far worse than the previous. While the past standard was disjointed, at least all of the content was correct. I can't say that for this draft.
771. This is not a scientific draft.
772. I strongly object to the confused phrasing of standards related to evolution and the deletion of the term evolution. Why would you do this?
773. Current standards should be retained.
774. Evolution it's important to teach
775. Pleade do not disadvantage Arizona students in the name of religious politics.
776. This is a full degradation of the existing standards. Completely shocking.  
It's factually incorrect to claim evolution is not a proven science. Please do not commit the future
777. students of Arizona to false science education. Evolution is a proven science and should be taught as such.
778. The term "evolution" has been almost eliminated.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually
779. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.  
There are not words in the English language to describe how inferior the new standards are to the old
780. ones. We have never had a problem with standards, the problem is in curriculum and in our teachers' depth of understanding of the science content. These problems were made worse by failing to make science a "high-stakes" subject as were math and reading.  
While not perfect and certainly dated, the 2004 Standards were based on scientific fact supported by
781. the scientific community. The present version is an outrage and will cause our Arizona students to receive an a substandard science education.  
Graphical organization is definitely improved, but changes in wording regarding evolution are obtuse and will confuse students. I teach biology for both children and adult students. My adult students
782. have told me directly that evolution helps them make sense of why other things in biology occur. Why do species look how they do in an environment? Why are cancer tumors genetically diverse? Why do we need a new flu vaccine every year? Evolution by natural selection is the core answer to all of these questions.
783. Yes!
784. Leave evolution alone. No creationism  
Creationism is faith based teaching it is not and should not be part of science teaching. I am a multi-
785. degreed scientist, engineer and a Christian. The fact that God is the creator is based on my faith, not the science I also acknowledge as man's way of trying to understand what and how God makes the universe function.
786. Much better. There are still some changes that need to be made.
787. keep your personal intelligent design theories out of our children's education!
788. Very wrong not to teach proven Science...
789. No, the addition of ideological language does not improve upon an understanding of science



790. Lessening the significance of evolution in the standards by removing the word or using qualifying language is a step backwards.
791. Please teach evolution and not creationism
792. Teaching evolution as the scientific theory it is should be an integral part of any science standards. Watering down teachings on evolution is not acceptable.
793. It is improved.
794. Diluted and subverted standards for evolution of organisms and creation of our universe impact credibility of the standards. Do we really want parents to pull their children FROM public education SO THAT THEY CAN ATTEND A SECULAR PRIVATE SCHOOL TO OBTAIN A TRUE SCIENCE EDUCATION?
795. See comment above
796. Please do not reference evolution as a theory and include it in teachings.
- The draft standards as prepared by the standards writing committee are a great improvement over the 2004 standards because they focus on three dimensional teaching and big ideas, and narrow the focus. That said, the internal edits added after the committee finished dilute the effectiveness of the standards as well as weakening instruction in several important areas, including but not limited to, evolution, climate change, and the origin of the universe as explained by the Big Bang. Also the addition of key concepts weakens the active voice of the standards, which otherwise clearly involve students in the practices of science.
797. It is too politicized and there is no need for creationism to be taught in science.
798. Are we aiming as low as we can?
- Students will not be able to see a connection with the materials taught in the beginning of the year vs the end of the year. The progression does not make sense and will cause confusion and the asking of 'why are we learning this?' to increase.
799. what a primitive way to teach children to evaluate and think logically by restricting information about evolution and big bang?? keep your religious views at home and out of the public schools!
800. Intelligent design is NOT testable or falsifiable, and therefore not science. Evolution is consensus and established science and belongs in curriculum.
801. There's apparently a bit more longitudinal interrelation in the current draft, relative to the 2004 version; but there's one particular aspect of interrelation that's conspicuous in its absence. I see lots of discussion of homeostasis, DNA, and so on — but no in-depth discussion at all of evolution. That's a problem.
802. The teaching of "Creationism" or any content alluding to "Creationism" has no place in any educational setting other than an overtly and specifically religious setting which is group specific.
803. See other comments.
804. Science Standard (2004) is not well organized as a document to lead teachers, students, community seeking information about AZ Science Standards.2018 Draft is clear easy to read framework to focus on Science Standards accross all grades with uniform growth and development for AZ students.
805. Diane Douglas is a sham of a educaiton superintendent -- leave your personal religious views away from my kids!
806. N/A
807. The current (2004) standards are fine. The proposed changes regarding the removal of "evolution" and "Big Bang Theory" are an affront to intelligent, educated people and these changes have no place in in the Arizona State Science Standards!!
808. Please do not equate the scientifically proven theory of evolution with creationism. There's a important little thing called separation of church and state. Please don't embarrass Arizona.
809. Except Evolution and big bang have been taken out.
810. Please see the above comment.
811. It is anti science.
812. DO NOT get rid of evolution standards. Religion has no place in the public school classroom. Please remove the religious rhetoric like "intelligent design" and other ambiguous language in the evolution standards. Evolution is a vital topic in biology and we would be doing a serious disservice to our students and the quality of education state-wide if you adopted these standards as they are in this draft. DO NOT adopt this draft.
813. DO NOT get rid of evolution standards. Religion has no place in the public school classroom. Please remove the religious rhetoric like "intelligent design" and other ambiguous language in the evolution standards. Evolution is a vital topic in biology and we would be doing a serious disservice to our students and the quality of education state-wide if you adopted these standards as they are in this draft. DO NOT adopt this draft.

815. Creationism should NOT be taught in public school.
- It is obvious to me that in the areas of evolution, genetics, natural selection and astrophysics that the draft has been changed to thinly veil an attempt to allow students to use religious views and faith based thinking in a science class. This is NOT acceptable and if the school board feels these non scientific ideals should be addressed it should not be done in a science class but in a comparative religions class or philosophy class.
816. based thinking in a science class. This is NOT acceptable and if the school board feels these non scientific ideals should be addressed it should not be done in a science class but in a comparative religions class or philosophy class.
817. Revision by non-scientists is inappropriate.
- Leaving out the teaching of evolution & the inclusion of so called intelligent design is neither intelligent or a good design. Keep church & state separate in public schools. Our children deserve to learn science in science class, not fantasy & opinions.
818. intelligent or a good design. Keep church & state separate in public schools. Our children deserve to learn science in science class, not fantasy & opinions.
- I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
819. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
- I really do not think that these are an improvement to the 2004 standards. The 2004 standards are much clearer and easy to follow. They also are more specific, in the way that they are not categorizing things under "plus" or "essential." Really, I think the "plus" and "essential" should be done away with because this means that some students will not learn the things that are on the "plus" list and will not be as advanced as their peers when they go to a university.
820. categorizing things under "plus" or "essential." Really, I think the "plus" and "essential" should be done away with because this means that some students will not learn the things that are on the "plus" list and will not be as advanced as their peers when they go to a university.
821. This judgment is based only on the edits. I have not read the whole 2004 standards. No "no response" option is allowed.
822. No "no response" option was provided. My response is based on the edits that I have observed.
- I am glad to see the update regarding evolution, week overdue in Charles Darwin's opinion. "There seems to be no more design in the variability of organic beings, and in the action of natural selection," he once wrote, "than in the course which the wind blows."
823. seems to be no more design in the variability of organic beings, and in the action of natural selection," he once wrote, "than in the course which the wind blows."
824. Any removal of evolution, despite other positive changes makes this draft irresponsible and not content driven.
825. This is taking a step backward. Another attempt at Arizona to condemn our children to not being prepared to attend good institutions of higher learning upon graduation.
- Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
826. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
- I think that the 2004 Standards are better than the proposed Standards of 2018. I fear that "creation science" is being slowly squeezed into the curriculum. There could later be an attempt present it as a scientific fact as opposed to a theory. My point is I don't even think creation science is a valid theory, let alone as a scientific fact.
827. I think that the 2004 Standards are better than the proposed Standards of 2018. I fear that "creation science" is being slowly squeezed into the curriculum. There could later be an attempt present it as a scientific fact as opposed to a theory. My point is I don't even think creation science is a valid theory, let alone as a scientific fact.
828. See above
- Please do NOT make changes that remove or downplay references to evolution and the big bang made by Diane Douglas. These changes, made to support a religious agenda by a person who is on the record as supporting "intelligent design" (which is about as scientific as believing that Mickey Mouse controls the weather) would doing our students a great disservice by removing or mumbling through references to genuine scientific principles and theories. Because they are supported by rigorous scientific research, data and real-world observation, evolution and the big bang are scientific theories. The "intelligent design" driven Ms. Douglas supports is based on religious beliefs and have no place in public education.
829. Please do NOT make changes that remove or downplay references to evolution and the big bang made by Diane Douglas. These changes, made to support a religious agenda by a person who is on the record as supporting "intelligent design" (which is about as scientific as believing that Mickey Mouse controls the weather) would doing our students a great disservice by removing or mumbling through references to genuine scientific principles and theories. Because they are supported by rigorous scientific research, data and real-world observation, evolution and the big bang are scientific theories. The "intelligent design" driven Ms. Douglas supports is based on religious beliefs and have no place in public education.
830. The draft introduces material that belongs to the realm of religious and personal belief, and in doing so compromises academic integrity and the quality of education that would ensue.
- Evolution must remain the dominant theory in science education for the students in AZ. AZ already is one of the lowest ranking states in education and these changes will continue to perpetuate the dumbing down of the next generation. It is a huge step backwards into the 19th century.
831. Evolution must remain the dominant theory in science education for the students in AZ. AZ already is one of the lowest ranking states in education and these changes will continue to perpetuate the dumbing down of the next generation. It is a huge step backwards into the 19th century.
- This attempted injection of religious doctrine and philosophy into public school curricula is an affront and shameful. Get on with supporting our public schools and educating our youth with the most rigorous and challenging science, math and arts curricula available--not some veiled attempt to push a religious, Medieval concept of humanity.
832. This attempted injection of religious doctrine and philosophy into public school curricula is an affront and shameful. Get on with supporting our public schools and educating our youth with the most rigorous and challenging science, math and arts curricula available--not some veiled attempt to push a religious, Medieval concept of humanity.
833. it's barely readable. where did you go to school?

834. Inserts religious content. Science standards must stick to science!  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
835. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
836. The draft does not present a clear explanation of evolution.
837. See comments above.
838. See answer to question 13
839. I cannot agree with taking terms such as "Evolution" out of our standards.
840. The language should preserve the science and not be rewritten to satisfy political or religious groups
841. I have no problem keeping references to evolution in the standards if that is the proper term.
842. The draft is inferior to the 2004 standards and should not be approved as currently submitted.
843. Verbiage watering down science regarding evolution is unconscionable. While supporting everyone's right to have a faith to believe in that line is crossed when you introduce it into public schools which are secular.
844. See above
845. Please do not enact these standards. This is a huge move backwards for our state and it will affect who chooses to move and raise children here.
846. The introduction of Religion into our Public Educational system goes against our Constitutional guarantee of separation of State and Religion.
847. why take out "mechanisms of biological evolution"? and the "big bang"? doing so 1) looks like pushing a particular religious agenda based on a narrow evangelical interpretation of scriptures (not shared by most mainstream Christians much less other religions). 2) leaves our students unprepared for college-level work. Arizona students would be disadvantaged by these omissions.
848. Largely similar, the areas of concern in the 2018 have been noted elsewhere in this survey response.  
Superintendent Davis, whose prior experience was in accounting, and elected by the narrowest margin, for political reasons, is determined to undermine secular education.
849. We need to encourage rational thinking without religious prejudice. The new standards, after previous rebuff by the Federal Government, attempts to use weasle wording to go around.
850. I have searched online for a readable copy of the draft science standards wo success, so I shall refrain from commenting on the standardd directly.
851. See previous comments.
852. There are less standards to cover, yet they are more vague and undefined. There is no scientific method unit, which leaves students to figure it out within each objective, giving them a willy nilly understanding of methods and procedures in science.
853. The organization of the content is extremely confusing for us as educators and will be difficult to implement.
854. It is much more confusing. I do like the engineering design and the cross cut ideas, but I think that could have easily been incorporated into what we have now.
855. It is more complicated to follow and is in two different locations. The current standards are much easier to follow and are clearly stated.
856. The current standards are easy to read and understand for parents, educators, and students. The new ones are overly complicated to understand a single strand without having to switch back and forth between appendices and standards.
857. The 2004 standards are imperfect. But the new standards are a hodgepodge of arbitrarily placing content in whatever grade level seems convenient. It used to be a problem that kids would learn cells in 6th grade, and DNA in 8th. Now it's worse.
858. The new standards are much easier to read!
859. It is more rigorous for the students but very random as to how it was organized.
860. The theory of evolution is the only scientific standard that should be referenced in any K-12 science curriculum in the context of human development. Creationism or any other religious-based term or

- concept has no place in our public schools and any reference to it in this context is unacceptable. There is no scientific question about this. The issue is entirely based on religious and political preferences and has no place in the Science Standards of any public school system.
- Please have teachers IN THEIR CORE SCIENCE choose the essential standards. It does not seem like this has been done. My specific example is Earth Science. The first three of our essential standards are REDUNDANT. Too much focus on energy without specifics. Narrow the essential standards and MORE courses will have the opportunity to incorporate them into their curriculum. Unless we do this, students are going to be hard pressed to receive instruction in all of them.
861. are REDUNDANT. Too much focus on energy without specifics. Narrow the essential standards and MORE courses will have the opportunity to incorporate them into their curriculum. Unless we do this, students are going to be hard pressed to receive instruction in all of them.
862. The number of certain topics have been reduced which is a good thing, but in many cases it is unclear what is being expected. The
- I do not agree with the increased emphasis on Earth and Space science standards. While increasing the number of essential questions tied to Earth and Space science the number of essential standards tied to Chemistry is low (only four standards). As a result, this removes chemistry as an option for many students to take (as there are a good number of students who plan on going to college but do not take a fourth year of science as it is not required). Having looked into how the standards could be assigned to different course sequences students could take to meet these 31 essential standards, subjects such as biology will have to absorb some essential standards that are better taught in a different discipline of science. Ultimately I question if these new standards are arranged in a manner that best meets the needs of our learners in preparation of higher education.
863. not take a fourth year of science as it is not required). Having looked into how the standards could be assigned to different course sequences students could take to meet these 31 essential standards, subjects such as biology will have to absorb some essential standards that are better taught in a different discipline of science. Ultimately I question if these new standards are arranged in a manner that best meets the needs of our learners in preparation of higher education.
864. I like the idea of students getting all of the standards within their three years of required science, but I do not think these standards are a good representation of what interests students. This is also creates a certification issue for many teachers.
865. They are more complex, difficult to navigate, and not specific enough. You do not know exactly what concepts are important to teach since it says "key concepts include but are not limited to". We also do not know the depth of knowledge.
866. I absolutely disagree. Shame on the board for promoting such anti-science standards. Arizona will again be a national laughing stock.
867. Standard is improvement, but the changes recommended by Ms. Douglas. She is totally unqualified to have input.
868. The draft is a perfect example of social engineering, and they stink!
869. As a scientist I am very disappointed in these modifications to the current standards. I feel that evolution is a proven concept not a theory. People can still have their theologic beliefs and accept and understand scientific standards supported by countless pieces of evidence and research. We must keep up with the standards of the rest of the world. We cannot allow ourselves to be dumbed down and go back to earlier teachings.
870. Referring to evolution as only a "theory" when the vast majority of all biological standards we know and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined.
871. Any attempt to limit the study of evolution makes this draft less current.
872. Anything is an improvement over teaching evolution, which can't be proven!  
I like the interdisciplinary focus of this draft.
873. I find the organization of the current standards much more clear and easy to follow. I appreciate seeing the names of the committee members and the external reviewers/consultants. I wonder if the DRAFT standards have been reviewed by external reviewers. If not, I think it would be an important step, especially given that many of the external reviewers/consultants are higher education professionals who know what K-12 students will need as they pursue higher education in science.
874. Too restrictive
875. You need to explain and teach FACTUAL science, which includes evolution!
876. Omitting references to "evolution" would be dumbing down of our children's education. It is also a subtle violation of separation of religion and state.
877. The 2004 Science Standards are acceptable while the current draft version is not, based on the reasons given previously.
878. see below
879. Referring to evolution as only a "theory" when the vast majority of all biological standards we know and teach is based on this is insulting and counterproductive to the teaching of science. Without

- establishing this as a foundation, the entire curriculum is undermined. Additionally creationism or anything pertaining to this should be excluded from any scientific public education.
- I feel very strongly that we do not abandon the term evolution in HS.L4U2.31 and HS+B.L4U2.20. Evolution is the crux of biology and must not be watered down or excluded. Biology can not be fully understood without the context of evolution and it must be included in all science classes studying life on earth. Our students will not be adequately prepared to study university level science courses without a clear understanding of evolution.
880. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
881. Seriously - do you not get it??? We need more rigor, not less. We need full funding, new textbooks, computers, lab sciences, and, to compete and succeed, we need to invest in our students and require and pay for professionally trained teachers. The Douglas/Ducey educational system and programs = a massive failure in all respects. Is that clear enough?
882. NOT with respect to focusing on the underlying mechanism of all biological change over time, namely Darwinian evolution and genetics. This is questioned as 'just' a theory in the 2018 standards as presented and will only confuse students when placed on equal footing with religious beliefs.
883. We cannot allow personal ideology or religious beliefs to dictate what is taught in a science curriculum in Arizona. The modifications proposed by Diane Douglas cannot be allowed. Religion belongs in a church. Science belongs in the classroom. We must hold Arizona education standards to the highest level of integrity.
884. Once again, standards that include religious doctrine and exclude long-accepted science are not appropriate in PUBLIC schools. Parents have the option to send their children to private schools or religious classes if they choose.
885. Do not teach religion in any form in science class. If you must teach any religious beliefs, then teach them all - every Native American belief on creation, every Hindu belief, every Muslim belief, every Buddhist belief, etc. not just one Christian belief.
886. The suggested content changes suggested by Diane Douglas with regard to evolution are ill founded and should not be adopted.
887. Any attempt at confusing future scientists and teachers with the obvious ignorant falsehoods in intelligent design will set back science and progress in our world and our state and will hurt the future of the young people that live in this state.
- The change in the following statement should not be made;  
L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct.
- If anything in this passage is changed it would be as follows;  
L4: The science of evolution makes clear the unity and diversity of living and extinct organisms. Over countless generations changes resulting from the development of natural diversity within a species has lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment have or will become extinct.
888. Also  
Analyze, interpret, and critique supporting evidence for the Big Bang theory and the scale of the Universe.  
Should not be change unless in the following manner.  
Analyze, interpret, and critique supporting evidence for the Big Bang and other scientific theories and the scale of the Universe.
- Wherever the above wording appears in the Arizona State Science Standards DRAFT they should be corrected as stated.  
I believe all schools which receive public funds (including vouchers) whether public, charter, private, home and/or parochial should be required by state law to adhere to and demonstrate ,through written curriculum and achievement tests, the adherence to all state standards.
889. Needs to retain references to evolution
890. I urge you to keep the concept and vocabulary of evolution in the Science Standards. To do otherwise, is to give our students the wrong information!!
891. It weakens the education of Arizona students when competing with other students from other states. Science is not a religion.



892. I strongly object to the changes that remove the term evolution and substitute other descriptive language or tag "theory" onto the end of evolution. Evolution is a well-established scientific phenomenon. Although everything starts as a theory, eventually after the theory is put to the test and is supported over and over again, it should be referred to directly and taught in our schools. These changes appear to be motivated by individual ideology, which has no place in curriculum development.
- Do not remove references to evolution and other scientifically proven materials. Keep our children's education completely neutral with regards to religion and faith. Do you want to create kids who can't make it in the STEM fields? Removing real science is a great way to fail the children in our schools.
893. This appears to be a thinly veiled attempt to manipulate or confuse students on the nature and factuality of evolution vs a simple belief in creationism or intelligent design.
894. Not as Douglas would have them read. Let the science professionals write and approve the standards
- There are many improvements on the whole, but not in regards to evolution. This abstract waters down evolution which is fact-based and makes it seem like it is simply a belief. Science is based on facts, not beliefs and not hunches. It should not be confused with religion, yet that is what these changes imply.
896. See item #13
897. Plenary of improvements could be made to clarify the Science Standards, most of the proposed changes are not improvements, but rather openings to promote non-scientific thinking.
898. why would anyone water down facts for students? I'm surprised that the solar system areas are not changed to "flat earth" ideas. It looks like someone went through and looked to change every instance of certain words like "evolution", "bang", and "environment", to name a few.
899. Why should evolution be removed from the standards. It can be taught along with creationism. But by removing it from the standards you are pushing a topic that is believed by Christians, therefore, pushing religion on students. Need I remind you, there is separation of church and state in this state. By removing evolution and pushing creationism, you are infringing on this separation.
900. KEEP the word EVOLUTION in the standards. Evolution is accepted science . There are NO alternative theories that are no religiously based.
901. Just in case anyone is missing my point, evolution is proven fact and should be taught in our public schools.
902. It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
903. Aligning to the next generation science standards is very important. AZ should align to the national standards so we can tap into the funding for national standards.
904. It undermines basic scientific theory. Public schools are not the forum for which religious personal ideology is integrated to change factual based scientific concepts. That is why private/religious based schools are already in existence. Douglas needs to keep her religious biased opinion out of the Science Standards or any Curricula Standard for that matter. If parents are objecting to their children being taught scientific fact, they have several options besides insisting on this major change in the scientific curriculum to support a secular thought. Private schools or home teaching, or Sunday school. Scientifically literate students are the future engineers, educators, etc. and will come away with a greater view of the world around them.
905. There are PARTS of the document that have improved. It appears as though the mention of scientific notation is newly added, which I support. The new document is also laid out better, although much more repetitive.
906. Put evolution and Big Bang back and expand these areas
907. Teach science not religious propaganda
908. My time is about to expire, so I'll just write TERRIBLE!
909. Please allow educators,not legislators, to create content for EDUCATIONAL standards. KEEP THEOLOGY OUT of the state standards.
910. I have not thoroughly viewed the 2004 nor the 2018 standards, nor am I certified to teach science - the standards appear reasonable.
911. There are some nice additions, I am troubled by the dilution of the scientific method and teaching scientific rigor. I don't understand why Science and Engineering are treated as one thing - they are
- 912.



quite different. I'm uncomfortable with inserting 'both positive and negative', while provocative, it implies that there are only two impacts: positive and negative. There may be neutral and multi nuanced impacts. I think this inserts unnecessary false dichotomy. Of course, removing the words 'evolution' and 'Big Bang theory' are just silly and indicate a lack of understanding of the business of science.

913. It adds nonsense to the standards.
914. Ridiculous misalignment with national science standards. Removal of evolution is a joke.
915. The world of STEM has changed since 2004 and we must keep up
916. I cannot agree with a de-emphasis or removal of key scientific ideas like evolution or the big bang as having "greater depth".
917. Science, not religion should be the focus of Science education
918. It isn't.
- I am opposed to the Diane Douglas proposed alterations in science standards for Arizona schools because of the thinly-veiled attempt by her to add her religious prejudices and beliefs into an area of which she has no knowledge, and which betrays the US Constitution's First Amendment establishment clause. "Intelligent design" is just Christian religious creationism deceitfully crafted to look like science, while attacking evolution by natural selection as "just a theory," when this scientific theory has been proven over and over to be fact (never refuted) and is considered settled science among the scientific community of the US and the civilized world. Diane Douglas is being dishonest when she claims that her religious beliefs "have nothing to do with" the changes. That is false pure and simple. Keep teaching evolution as settled science, and put creationism/"intelligent design" where it should be: in church.
- 919.
920. AZ can not back away from the teaching of evolution.
- Limiting the study of evolution to "the unity and diversity of living and extinct organisms" is ludicrous. Fiction does not belong in science class, and the international scientific community (who have devoted their lives to studying science) is clear in their endorsement of the theory of evolution. That alone should end the discussion.
- 921.
- The high school standards are potentially much better than the 2004 standards. But they are awkward to implement. To solve the problem, (a) eliminate each "essential standard" that doesn't fit into TWO of the four course categories: physics, chemistry, biology, or earth/space science. (b) NARROW them down; they are too complex. In high school, students are ready to understand the structure of the subject; these improvements will avoid schools needing to have "integrated science" courses, which end up being superficial "fragmented science".
- 922.
923. Given the concerns about watering down of standards and the political context therein, it would be better to maintain our current standards than change.
924. Current standards do not insert religious bias into the study of science.
925. It is disgusting injecting religious rhetoric into public school standards. The religious zealots are a cancer.
926. This is a blatant attempt amongst others to drive Arizona education back into Medieval times.
927. See above.
- We need to retain references to and explanation of evolution. Evolution does not deny the existence of God. It is an observable fact. Just look at the bacterial adaptation to antibiotics, which requires us to use stronger and stronger antibiotics. Even the Big Bang required a Higher Power to initiate it. Arizona students deserve to be on an equal footing with students in the rest of the U.S. Evolution is an important factor in our understanding of the world.
- 928.
929. Removing evolution from curriculum is an extreme political decision rather than a sound educational one. These standards drive the instruction in our public schools where there is a distinct separation of church and state. There is an overwhelming support of the theory of evolution in the scientific community and there is an overwhelming critique of this theory in some religious communities. Such a decision to remove the theory of evolution from curriculum in our public schools is an assertion of religious belief that ultimately is unconstitutional and infringes on the rights of those who do not hold the same religious beliefs. There is no reason why multiple theories cannot be addressed. Creationism fits perfectly in Western Civilization Social Studies courses as it is comes from an essential text, The Bible, that greatly influenced the development of the Western Hemisphere. There is no reason both theories cannot be learned together. Learning both theories from these different disciplines helps develop well-rounded, well-educated citizens for our state.

930. The elimination of the understanding of the concepts of evolution at a high school level will be detrimental to students ability to be successful in college and is not preparing them for life with a full understanding of the scientific underpinnings of our society.
931. Yes, these standards are an improvement, but not clear how the standards were assigned to each grade.
932. Evolution needs to be the only aspect taught. It has been PROVEN.
933. Both have basic grade-level appropriate standards. I'm not sure one is actually an improvement over the other, both appear appropriate In the 2004 version, the concepts in Strand 6 are clearly articulated, while the concepts are mission from the 2018 version. I think that is a problem.
934. This DRAFT substitutes the words "Theory of Evolution" for the word "Evolution" in all the life sciences but doesn't do so for the evolution of the universe or the solar system. This suggests an attempt to allow the teaching of 'intelligent design' as an alternate explanation. No religious belief has any place in a curriculum. Biological evolution is a well established explanation accepted by over 95% of scientists and Pope Francis.
935. I believe that what should be evaluated is the current proposed standard. The earlier, good, bad, or indifferent, is irrelevant
936. References to "theory of evolution" in the DRAFT is unacceptable. Especially as you include language that says "a theory becomes acceptable when it has been shown to be superior to other explanations." Clearly you expect students to calculate, develop models, analyze data, investigate, make observations, and gather data and evidence to construct logical and coherent explanations in determining how the world works. Such practices are possible when studying biological evolution and natural selection. If you are going to revise your Science standards to allow discussions of creationism and intelligent design, then you are doing students a disservice, you are undermining your own standards of scientific practices and rigor, and you are ignoring the separation of church and state.
937. The new standard is scientifically deeply flawed and cannot be called a "science" standard. It instead suggests to substitute the teaching of unbiased, objective scientific method with indoctrination!
- It is a disservice to AZ public education to remove references to evolution from the science curriculum.
- Although evolution is referred to as a scientific theory, in the science context "theory" is a well-substantiated explanation that incorporates facts, laws, inferences, and repeatedly tested hypotheses.
938. Therefore, we just refer to it as evolution.
- To eliminate such a widely accepted concept or to alter the language so that it avoids the term is unfair to our students and puts us at odds with the rest of the country and world. AZ struggles enough with our educational performance - let's not add this to it.
939. Elimination of distinction that organism diversity is a result of evolution is unacceptable.
940. The new DRAFT is easier to follow and is including the framework which is excellent to tie in all the nature of science into all the core concepts
941. Removal of evolution and the big bang theory make this draft a step backwards and will make it a hindrance to learning.
942. Please put back in the language and content surrounding evolution. It disadvantages our children to deprive them of academic learning and scientific fact.
943. Religion has no place in the classroom that is why we have a separation of church and state.
944. The 2004 Standards are more a series of facts to cover while these require active learning on the part of students
945. The current Science standards much better than the suggested ones.  
If a change than the NGSS should be adopted
946. None
947. I protest the changes that would eliminate evolution from the standards in any way. Public school standards should not revert back to the age of ignorance when knowledge of science can be ignored or erased.
948. The draft of the 2018 Science Standards is much improved. I would use this document as a beginning document as I plan my units over the summer. However, I will explore and use other neighboring state's science standards as well.
949. This draft is definitely an improvement, but still needs to be adjusted further to ensure student achievement
950. Does not need any non scientific hypothesis such as creationism

951. With the exception that the prior standards allowed students more choice in the science education trajectory.
952. I have not reviewed the prior standards and have no comment.
953. The inclusion of non-research based opinions make these standards inferior.
954. Calling evolution diversity is a step back to the dark ages and my tax dollars don't want to pay for fake science.
955. There really is no difference other than the standards added more cognitive verbs to the performance objectives.
956. The current standards needed updating, but not with arcane superstition and politics. Science is the actual opposite of faith, and shouldn't have to accommodate the feelings of any body of people, no matter how much they donate to political campaigns.
957. I'm really here to protest the Superintendents sneaky edits and in my opinion, dishonest attempt to promote her religion in our public schools.
958. More time should be spent on ways to help students learn and less time on political agendas. When you find a way to stop bullying and find a way to have kids enjoy learning, then tackle changing things.
959. By omitting the references to evolution you are disregarding a major facet of science, which means that children are not receiving a full science education. You can have discussions about evolution and its relationship with religion in religion classes, as many parochial schools now do.
960. The standard needing updating, but this version fall far short. I would think long and hard before hiring someone educated in Arizona.
961. it is nothing less than a veiled attempt to diminish the theory of evolution and allow the input of intelligent design into the science curriculum.
962. The effort to adapt standards to fit 3D Teaching and Learning was over-emphasized (new flavor of the month)
963. Additionally, having a single person take what a group of people have worked on and make changes based on a personal agenda is unprofessional and inappropriate on many levels.
964. The theories of gravity and evolution are equivalent. Both has been proved repeatedly using the scientific method. Physicists refer to gravity as a law. Evolution is one the foundation of biology and is critical to all aspects of life on Earth. Humans do not have the option of ignoring gravity and cannot afford to ignore the principles of evolution. Any changes to Arizona's Science Standards which delete the use of evolution should be recognized as attempt to deny a universal principle supported by the majority of humans.
965. If you can't do any better than this, stick with the 2004 Standards. Only change the standards as new knowledge emerges in the peer-reviewed scientific literature after being reviewed by notable scientists from ASU and UA! Ms. Douglas, you have no business in the science standards business; stick with what you know and get expert advice when you need it! I am appalled at the suggestion that religious faith/belief is being considered for the science curriculum in Arizona! With all the problems with education in Arizona, can't you put your efforts and resources into an area that will benefit our students. You are showing that you have no business in preparing curriculum for Arizona students.
966. See above.
967. The current standards are adequate - no change is needed, particularly not the changes proposed in this draft.
968. I strongly feel the term evolution should NOT be taken out or changed in any way in Arizona Science standards.
969. Evolution was a theory, but due to the testing that the former theory of evolution has been subjected to; evolution is no longer a theory. This is not the time for another Scopes trial (this time Arizona rather than Tennessee as the prosecutor).
970. Adopt NGSS!
971. Changing the Science curriculum to include "intelligent design" or creationism as alternatives to evolution is absolutely not okay.
972. The proposed changes in the teaching of evolution in science curriculum are not acceptable. Evolution is not a theory and is backed up by numerous facts and hard evidence. Creationism and Intelligent Design are not even theories but rather beliefs that are not backed up by any credible evidence. Keep religion out of our public school system.
973. Removing language that we had in 2004 in relationship evolution is a step backwards.

973. The 2018 draft is too exclusive.
974. Less attention to specific POs that often seemed somewhat disjointed. The flow and 'cohesion' of these are welcome improvements.
975. The elimination of references to evolution makes the recommended draft a step backward in education.
976. Evolution is soundly grounded in scientific evidence. Do not bring religious beliefs into teaching children science.
977. The insertion of these non-scientific qualifiers on the subjects of evolution and the origins of the universe taints the entire curriculum. I do not propose changing the words of the Bible to such things as "Jesus= a [possibly] historical figure who many people purport to believe in." Leave science to science and religion to religion.
978. The draft does not read well and is hard to understand with the suggested changes.
979. Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.  
Thus, public schools may not promote any faith or religion based view of science.
980. lacks specific perform objectives  
Many concepts are not aligned to grade level. What are described as key concepts are merely vocabulary words, not concepts.
981. There are standards that are not accurate. For example, K.P2U2.1 kindergarten standard talks about the five senses and body parts. That is NOT physical science--it is anatomy/life sciences. This example continues on through several grades where instead of talking about how light travels, they talk about how the human eye perceives light. STudents should be learning about how sound and light travel, how they do and do not behave, etc.
982. I didn't see a great improvement.
983. I cannot imagine that evolution is not mentioned in the 2004 standards. I am just a concerned parent and cannot review the 2004 draft as well.
984. The word evolution should be kept in the Arizona science standards due to its importance to modern science and it's fundamental role in understanding the world we inhabit.
985. Creationism is a religious belief, not a scientific theory. Leave all references to creationism or other concepts based on a particular set of religious beliefs out of the science standards. They have no place in true science instruction.
986. Do NOT eliminate the study of Evolution and Big Bang Theory by name and concept in the new standards. These are considered a major part of scientific knowledge.
987. This seems to be an offensive over-reach by a secular official to mandate that public education conform to her own personal views. This may be violation of her Oath of Office, which requires adherence to the United States Constitution. This Foundational document establishes a separation between any Church, and the State. 'Semantic sanitizing' of words or language that one person (or group) may consider unacceptable is an abuse of power.
988. Page 40, Life Science, clearly articulates the principles of evolutionary theory. Put it back.
989. Yes, but NGSS is more cohesive and works to integrate each year into the next better.
990. P. 44 - that was the first page I noticed that the word evolution was stricken and replaced with change, though the two words are synonymous. Eliminating the word evolution panders to a certain audience when really, no change was needed. Biological diversity is misleading and grossly understates the actual process of what changes are occurring.
991. The 2018 science standards is confusing to true students of science and does not teach the full breath of subjects studied.
992. Evolution needs to be taught.  
The standards are weakened by the effort of Diane Douglas to infuse religious notions into science.
993. There's a big difference between what we want to believe and facts and the rigorous underpinnings of science theories.
994. The addition of the 3 dimensions and some updated content is a welcome change from our current standards, but the draft as it stand s now is NOT an acceptable replacement! Arizona educators

- contributed to the NGSS--we should take that set of standards and have committees of AZ educators and content experts examine it and see if it could be changed to meet the needs of our students.
995. In general I think the deleted wording in the "DRAFT Released XXXX DRAFT" is generally to be preferred.
996. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
997. no comment
998. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom! Please
999. Given my comments in #13 above, I cannot say that they are an improvement, except in the fact that they are at least partially informed by the NRC 2012 Curriculum Framework for K-12 Science Education.
1000. I cannot endorse any curriculum with religious content. Intelligent design and evolution can co exist, but intelligent should be taught at home and left to parents to explain their family's belief system to their children.
1001. Frankly, there's not much that changed and all the hoopla from the Left is much ado about nothing. For example, the Theory of Evolution has not been banned from the curricula. Rather, the DRAFT is more scientifically rigorous in that it does not presume that "new species can evolve." (Something that has never been observed. Which one would think would be observed every once in a while considering the trillion species on the earth.)
1002. The 2004 science standards are much better overall than these commomon core state standards.
1003. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
1004. Evolution and the Big Bang should be returned to the standards. Arizona science standards should focus on science.
1005. Take your religion and separate it from a government position. Your religion does not belong in my science lessons. THIS IS SCIENCE CLASS, NOT RELIGION CLASS!
1006. The older standards were much more specific and detailed than the draft standards. When reading the draft standards, I constantly end up asking myself, "Okay ... what am I supposed to teach?"
1007. These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
1008. In some ways the DRAFT standards have improved (they are more fleshed out, they include "plus" and "essential" standards), however in other ways the language has been watered down to remove language about evolution and the Big Bang.
1009. The new draft, with its intentional removal of well-established scientific understanding, including the concept of biological evolution and climate change, is simply abhorrent. It is an assault upon modern society and civilization itself by these brazenly anti-science, anti-education theocratic activists.
1010. They seem very similar
1011. The content is weakened compared to previous standards. Removal of references to evolution is unnecessary and misleading.
1012. There is no reasonable explanation to remove the study of the theory of evolution from the AZ Science Standards.
1013. No religion in our schools
1014. No religion in our schools please! Unconstitutional!
1015. ID is not science. Teach science in schools. Teach religion at church. If you want to learn about ID exclusively, go to a religious school.
1016. Teach evolution. Teach "Big Bang."
1017. This wording regarding the theory of evolution is awkward and unnecessarily obfuscatory: "L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms." The theory of evolution explains the diversity we see in the present and past world. The diversity is the result of evolution. Changing the wording is clearly a politically motivated attempt to muddy the waters. Considering the fact that evolution is a fundamental concept in biology, this new wording is inappropriate and will lead to poorer outcomes for Arizona students.



This language: "Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions." is patently ridiculous. Scientists do not "believe" in things. Scientists have evidence/data that supports the theory of natural selection. The sentence should be reworded to state: "Over countless generations, those individuals within a population that are best suited to the environment survive longest and leave more offspring. This process is known as natural selection. The changes resulting from this natural diversity within a species is known as evolution."

In this section: "... understand how genetic information is passed down to produce variation among the population contributing to evolution,..." do NOT remove the section "population contributing to evolution."

In this section: "Students develop an understanding of patterns and how genetic information is passed from generation to generation. They also develop the understanding of adaptations contribute to the process of biological evolution how traits within populations change over time." do NOT remove the section "adaptations contribute to the process of biological evolution."

In this section: "HS.L4U2.31  
Obtain, evaluate, and communicate evidence that describes how inherited traits in a population can lead to evolution biological diversity." do NOT replace "evolution" with "biological diversity."

In this section: "HS+B.L4U1.19  
Construct an explanation based on evidence that the process of evolution may result from natural selection." REMOVE the word "may" and replace "result" with "results".

In this section: "Gather, evaluate, and communicate multiple lines of empirical evidence to explain the mechanisms of biological evolution change in genetic composition of a population over successive generations." - Do NOT change the wording of this section, at all.

In this section: " L4: The theory of evolution seeks to make clear the unity and diversity of organisms, living and extinct, is the result of evolution organisms. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct." do NOT make any of the proposed changes

This verbiage: "By the end of fourth grade, students understand that Earth systems are impacted by different forms of energy. In this grade level, students expand their understanding of electricity and magnetism. Students also understand how weather, climate, human interactions, and geological systems change and shape the earth and the factors impacting organism diversity." where this section: "By the end of fourth grade, students understand that Earth systems are impacted by different forms of energy. In this grade level, students expand their understanding of electricity and magnetism. Students also understand how weather, climate, human interactions, and geological systems change and shape the earth and the factors impacting organism diversity." has been removed is a CLEAR attempt

It is not any better, we are still overloaded with curriculum that is expected to be taught and reviewed, by early April of every year. If we are going to have mostly Earth Sciece, then take out the huge weather unit.

1019. This wording regarding the theory of evolution is awkward and unnecessarily obfuscatory: "L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms." The theory of evolution explains the diversity we see in the present and past world. The diversity is the result of evolution. Changing the wording is clearly a politically motivated attempt to muddy the waters. Considering the fact that evolution is a fundamental concept in biology, this new wording is inappropriate and will lead to poorer outcomes for Arizona students.

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1020. The language used appears to water down commonly accepted scientific concepts
1021. This DRAFT should have been designed and vetted by scientists not by Diane Douglas who has no science training.
1022. The attempt to facilitate three dimensional learning in the new standards is an improvement over the check list format of science facts which appeared in the previous standards.
1023. To "rewrite" science is idiotic. This DRAFT should be thrown out and school Superintendent Diane Douglas should be fired for being such an embarrassment to Arizona. This is the year 2018 not 1818. It appears to be an improvement overall, but the idea of including creationism is a serious error. Not only does this straddle the line separating church and state, but begins to egregiously tear down the fundamental ideals of science. If we teach our students that a story is as good as a well tested scientific theory, what are we preparing them for? We are preparing them to blindly accept stories for fact and to fall in line. This is not what we want from our students. We want them to be critical thinkers who use the scientific method to come to conclusions instead of an old story book.
- 1024.
1025. I strongly disagree with the push to modify and dilute the Arizona Science Standards!
1026. I believe it is wrong, from an accuracy standpoint, to replace references to "the scientific method" with "Formerly known as the scientific method, the science and engineering practices." The term "scientific method" describes a rigorous methodology that is still valid and being used today in all scientific research. The term "practices" implies a lack of universally adopted and used methods and does not reflect how science is conducted.

Furthermore, I believe it is wrong to remove references to "evolution" and to change the references that are left, for example, from "The unity and diversity of organisms, living and extinct, is the result of evolution" to "The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms." The process of evolution has been proven in real-time, current laboratory

experiments. When "theory" is used in reference to a scientific term, it does not mean the same thing as when it is used in everyday language. In everyday language "theory" means a hunch or speculation. But in science, "theory" refers to a comprehensive explanation of an important aspect of nature that is supported by a multitude of facts gathered over time.

I also believe it is shortchanging students to remove references to the Big Bang.

1027. Religious beliefs have no place in science standards. DO NOT remove references to evolution and replace facts with religious terms. We are already falling behind the rest of the world.
1028. Evolution should NOT be removed
1029. Teach evolution and leave religion out of schools. Why do we even have to tell you that it is illegal? Do your job please.  
If the ideas of the Big Bang Theory and Evolution are deleted, we are no longer providing Arizona's children with current, relevant information. Why would we go backwards in providing a less relevant education to children who will need to compete in a global marketplace for both higher education and jobs?
1030. Without the inclusion of how all origin of life theories use the scientific process and the observable scientific evidence, the standards are incomplete.
1031. I believe they could be much better by adopting the NGSS standards
1032. 2004 standards deeply covered more topics.
1033. The standards were not broken before. Why fix it?
1034. Any science standard that obfuscates the significance of evolution is lacking.
1035. Put it back the way it was.  
The draft of the science standards compared to Arizona's current (2004) science standards is an improvement because it is aligned more closely to the national next generation of science standards. The new shift will bring about more effective teaching practices for STEM as a change in job innovations is imminent for our students' future.
1036. There is clearly an agenda here. We are raising future science professionals and they are being taught from standards that have no basis in science.
1037. As a biology educator at the university level, I know it is important to have incoming students be conversant in the terms and concepts of biology. Evolution is a core principle of biology and while the draft standards reflect learning outcomes related to the importance and mechanisms of evolution, the avoidance of the term "evolution" is inappropriate and a disservice to the students.
1038. Evolution is science, anyone who wants to teach their kids religion should put their kids in a religious school of their choice. Don't embarrass Arizona by making us look like morons to the rest of the country. Evolution is fact and that is that!
1039. I like how the crosscutting concepts and science and engineering practices have been built into the content standards instead of as themes stated in the introduction and never mentioned again, or as stand-alone standards. The new draft is much more cohesive and indicative of what scientists do.
1040. It will certainly turn away any large scale businesses that depend on educated people for success.  
The redefining and watering down of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is inaccurate and misleading. This definition does not reflect what Evolution and the Theory of Natural Selection are. Evolution is a universally accepted scientific theory and teaching alternate religious-based, non-scientific "theories" is a violation of Church and State. Parents are free to teach their children religion in their homes. Only science should be taught in schools. The term and definition of evolution and teaching of it should remain as is.
1041. The 2004 Standards are a simplistic version that I was expecting for Standards. This lets teachers and districts to clarify more on each standard.
1042. The information provided through 2018s version is good, however the 2004 version is easier to read and check-off. Maybe try breaking the standards down a little bit, just as the 2004 version is.
1043. although the draft has similar parts as the 2004 does it includes more and pulls it together in a better model.
1044. I feel like they are similar where as they are both a bit difficult to understand, but the 2004 seemed to be broken down in a way that is easier to understand. Though I do find that 2018 draft seems to give more information, but at this time I am unsure if that is a good thing or a bad thing.
1045. I do not think creationism should be taught in schools. Science should be based in actual science and

- facts.
1049. You can't go from one extreme to the next without some steps along the way (from the old standards to the new standards). Basically going from identifying to complex DOK 3 and 4 levels. You are setting these kids up for failure with the current draft of science standards.
1050. It is an improvement, but I was hopeful for more substantial change, especially in regards to applying a 3-D model of instruction. There is an emphasis on more than just content, but it is not to the extent that their needs to be.
1051. I think the rigor is definitely increased however it is not developmentally appropriate for first graders.
1052. The 2004 Standards are very simple to get information and objectives from.
1053. Evolution and the Big Bang Theory should not be taught in the schools.
1054. keep evolution reject intelligent design...fire this lying woman
1055. No Biblical teachings in public education.
1056. They are based on fallacies that do not pertain to known science. A blatant attempt by religious conservatives to introduce religion into our schools. We have already had the Scopes Trial.  
There is a much better sense of the nature of science being an investigative and discovery process by which we attempt to better understand the nature of our universe and how we can use scientific methods to increase our knowledge of such. The 3D model which includes applications and
1057. discussions of how this knowledge affects our world and existence (and humanity) are incredibly important. The previous standards paid lip-service at best to any kind of a focus on the process of science and seemed much more like a shopping list of tidbits to remember without any kind of unifying themes or cross-cutting concepts. This is definitely an improvement.
1058. The standards that were released are more of the same. The standards created by the working group needs to be released.
1059. I have not analyzed the 2004 standards in any depth.  
I have been teaching for a long time - the formatting of these standards is well organized and the
1060. connections to other content areas, especially to math, are explained. However, the actual themes and content are not much different than the FOSS kits from years ago.
1061. Less depth more skimming over many concepts. Jumping in and out of the physical vs Earth, vs Space science  
7.L1U3.8 is unclear as to what devices for maintaining homeostasis. Food and nutrition? Air conditioning and heating?  
8.L1U3.2 also clear about technology for physical chemical properties ???
1062. 8.P4unU1.4- math models for energy is unclear. What kind of energy?? Does this relate to light spectrum, electricity, sound, earthquakes  
8.P4U3.5 confusing is this related to the periodic table?? Conductivity of different metals?? This needs to be clarified
1063. I think that we need to focus at each grade level on certain concepts to ensure the understanding that the students need for science. The concepts are too confusing.
1064. The introduction of new standards that include more engineering processes is a move in the right direction.  
It was on the right path, but the most recent edits have made it an embarrassment. As another example:
1065. Originally, 2.P1U2.2 read: ....heating or cooling can cause a phase change. The edit suggested changing phase change to transformation. Phase change is a scientifically recognized term and transformation is not.  
The theory of evolution, The Big Bang theory are as valid as The theory of gravity. I do not believe
1066. Diane Douglas has any privileged proof of the intelligent design she apparently would like to add to our schools' curriculum.
1067. Here are just two reasons for rejecting "dumbing down" Arizona High School Standards:
- Not crippling economic development
- We in Arizona seek to enhance BioScience initiatives. Both on medical and agricultural frontiers. An understanding of evolutionary biology is essential on both fronts. Science, Technology, Engineering and Mathematics (STEM) that we would recruit to Wyoming will demand very standards for education of their children and grandchildren in Arizona.

- Not putting Arizona high school graduates at a disadvantage at Arizona universities

Between 1/4 and 1/3 of students at our three fine Arizona universities, the University of Arizona, Arizona State University, and Northern Arizona University, come from out of state. Most students from out of state will have been educated under higher standards. Please, let us not disadvantage our own children and grandchildren by “dumbing down” our Arizona standards.

The language seems to be accurate, and more descriptive than before. Many people don't like the changes that are being made, but if the proposed wording were in the original version, I expect that it would be well-accepted.

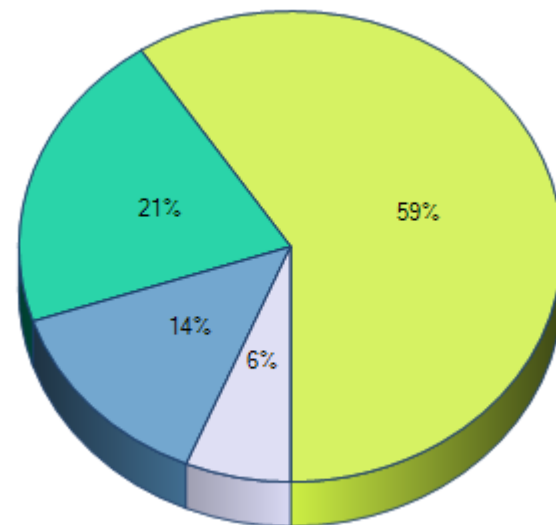
1069. Creation Science or Scientific Creationism is NOT science.

1070. Religious beliefs based on faith, not scientific facts, have been added.

The language seems to be accurate, and more descriptive than before. Many people don't like the changes that are being made, but if the proposed wording were in the original version, I expect that it would be well-accepted.

**Total Respondents 1071**

**13.** I support the State Board of Education adopting this DRAFT as Arizona's Science Standards.



	Response Total	Response Percent
Strongly Agree (draft needs very few revisions)	103	6%
Agree (draft needs moderate revisions)	223	14%
Disagree (draft needs extensive revisions)	342	21%
Strongly Disagree (draft does not represent student Science learning needs)	973	59%
<b>Total Respondents</b>	<b>1641</b>	
<b>(skipped this question)</b>	7196	

**14.** Please comment about whether Arizona's State Board of Education should adopt this DRAFT as Arizona's Science Standards.

1. Remove ADE additions
2. DO NOT adopt these standards.
3. State board - please demand that ADE return the standards back to the draft as the teachers wrote it.
4. Yes
5. Order of standards does not make sense. Students should learn human body systems past 3rd grade.
6. They aren't scaffolded properly for middle school. The standards are very open and lack direction.
7. There are a few standards that have moved grade levels. I don't think it is an advantage to add Earth and Space 8.E1U1.6 (ages of rock) this standard should stay with 7th grade where rocks and fossils are taught. You can't teach about fossils and rocks without talking about the age of the earth. Also moving the force and motion/Newton's laws standard from 8th to 7th is a bad idea. When students enroll in high school 9th grade standard Science class is physics and chemistry. We are putting our students at a disadvantage by the lapse in time between 7th and 9th grade. This force and motion

- standard fits perfectly with the energy standards that 8th will teach. It ties all of the concepts together. transfer of energy can be directly related to forces and motion.
- No- I am not sure why science has to be the only tested content area where the test covers 3 years of information and very different information than Reading, Writing and Math- these test the information presented in that year of learning. There are virtually NO earth-space or Physics teachers out there to teach the classes the students are to have in HS. This is forcing HS to make a Jr year "review class" to cram ( again, lack of depth) all the "key concepts" into a student in 1 year and hope something sticks. It has some tasks that are way beyond the ability of students at a grade level OR requires much technology or lab ware that many rural schools cannot afford.
8. I have no problems with adopting these standards. However, there is no possible way that I can teach Science for 45 minutes each day, with the demands I already have. I am teaching ELA for 90 minutes each day, as well as 90 of math each day, The Leader in Me program, and 30 minute intervention reading group each day. My schedule is jammed packed with practice AZ Merit testing, diagnostic testing and many more required programs. As it is, I struggle with finding the time to teach all the content standards. If the state is requiring me to teach Science and Social Studies 45 minutes each day, something HAS to give!!!!!!!!!!!!!! AND what about the materials that will be needed for science. How will that be provided? I am not willing to spend even more of MY money for school supplies. The lack of funding is so bad, I am having to spend MY money on basic school supplies, such as pencils and paper.
9. I would much rather keep the old standards than switch to the currently proposed new standards
10. I strongly feel the state board of education should adopt these new science standards. Arizona desperately needs a change and update in these standards.
11. I think it's a great start, but there has to be more foundation in the younger grades for scientific thinking and earth science, especially the older grades are so heavy in content.
12. The availability of curriculum options will be extremely limited. By making up Arizona's own standards teachers in the state will be limited. NGSS is used across the nation and would allow more curricular choices & opportunities for teacher collaboration.
13. The drafts should be adopted, however, a bigger picture needs to be looked at. Such as, how are districts going to teach this and what curriculum can be used?
14. I believe Arizona should have adopted the NGSS Standards five years ago, rather than spend hundreds of thousands of dollars rewriting a national set of standards. Most current curriculum is aligned to NGSS and this poses problems to Arizona schools when considering new curriculum adoption.
15. The middle school standards for 7th and 8th need to be adjusted. Students are not ready for the mathematics involved to do physic and forces and motion in 7th grade. It is best to keep the forces and motion in 8th grade. Also, energy, forces and motion, and chemistry all intertwine with each other and should be taught together in the 8th grade. Remove the earth science standard of age of the earth from the 8th standard and put it back to 7th standard. The 7th grade can not teach about fossils without discussing the age of the earth.
16. The key concepts should be removed as they limit the standards from being the dynamic standards that they were intended to be in their committee development phase.
17. Please go back and rework and clarify the standards.. more depth..more details.
18. With the key concepts and ADE additions, these standards should NOT be adopted by the state school board. They all need to be removed before the board should even consider adopting these standards.
19. Please refer to my comments about the lack of engineering, technology and geology. I coached a robotics team made up of 4th and 5th grades to a World championship and I had to teach the kids about gears and ratios and then coding. WHERE IS ALL OF THIS!!!!!!
20. Science and technology are key to having 20th century learners. These will not prepare students for careers in STEM fields or in any field related to science and/or technology. This would be a disservice to our students and would put them behind their peers in other states who have adopted the NGSS
21. I think that after some improvements, it will be good.
22. Yes, the content and depth are excellent.
23. I like them EXCEPT where I see under Key Concepts in 6th grade when that concept was touched on in the 4th grade. Teachers will HAVE to go back and reteach everything they learned in 4th grade. They need to be more stream lined. I have to go back and re-teach cells every year, even though they were taught about cells in the 6th grade.
24. In the 6th grade standards there was a concept that was taught previously in the 3rd grade! One in 7th grade where the previous concept was taught in the 2nd grade!



25. It only appears that things were moved around rather than having been changed.
26. I believe the standards per grade need to connect more and synergize better
27. Please consider Life - 6th grade, Earth - 7th, and Physical - 8th. This is a much better option. Schools and teachers will save money in this way.
28. Looks good as long as you remove all of the ADE changes.
29. na
30. The standards should be adopted.
31. I support the new standards, but more emphasis should be placed on climate science in 7th or 8th grade.  
I think these new standards are not necessary and will cause confusion for students. I do like that the standards require a higher level of thinking as opposed to the 2004 standards, but I think the 2004 standards can easily be adapted to meet these DOK levels.
32. I think these new standards are not necessary and will cause confusion for students. I do like that the standards require a higher level of thinking as opposed to the 2004 standards, but I think the 2004 standards can easily be adapted to meet these DOK levels.
33. No, I think making our standards more precise is a necessary change but content needs to be more connected and should build on previous grade levels each year and not reintroduced 2-3 years later.
34. This may be a good start, but these need a lot of revision.
35. The draft should be put back before the revision committee rather than adopted with the internal revisions.  
As written, Arizona is better off keeping the current standards and the State Board should NOT adopt these. If the key concepts are removed and the weird and inappropriate connections to other content areas are removed, then I would support adoption.
36. If the key concepts are removed and the weird and inappropriate connections to other content areas are removed, then I would support adoption.
37. I consider the proposed changes to be significant, although they could be fixed via "moderate" revisions.
38. The standards proposed in there DRAFT are ambiguous about questions regarding evolution. Such ambiguity is not warranted and could be misleading.
39. Evolution must be prominently displayed and taught as a fact, the same as the theory of gravity.
40. Because if the comments above, I do not approve the adoption of the draft.
41. Our students deserve to learn accurate science. As a biology professor I see students from AZ K-12 schools enter with a rudimentary knowledge of at best. It needs to be strengthened, not watered down as this draft standard does.
42. There was clearly a ton of work put into these standards; however, why is our state simply not adopting the Next Gen standards? I worry about state-to-state consistency for our students who move or compete against students from other states for scholarships or learning opportunities.
43. With specific regard to the issues addressed by the National Center for Science Education, I agree with Arizona's position on leaving the specific conditions of biodiversity and the source of diversity on Earth INTENTIONALLY AMBIGUOUS leaving room for more facts to come into the light (HS+B.L4U2.20). There is significant and growing evidence, such as the growing contingency of reputable scientists that have dismissed "Darwinian" evolution, the disagreement among scientists (on reliable dating methods for example) on the standard "scientific" timeline aging the Earth to billions of years old while some make a compelling argument for a much younger Earth (8.E1U1.6), as well as the variable theories on the source(s) of abiogenesis (a few credible scientists believe there is enough evidence to suggest multiple abiogenesis events), as to warrant a much more conservative position on this particular content area, specifically. I see no issue with the other standards as they are observable, provable, repeatable, and, most importantly, do not challenge faith-based theories. They aren't as subject to interpretation as the THEORY of evolution is.  
  
On a personal note, I have a very hard time delivering evolution from text books to my students as FACT when there are more examples in history of science being proven wrong than correct. How much of what we teach our kids today is the same "fact" students may have learned 100 years ago? The Earth was believed to be flat, not because it was provable of course, but because no one credible or trusted was brave enough to confront popular thought until someone was. There are enough debunked theories to suppose that the only certainty in science is that it will be certainly updated. We rewrite text books yearly to show all the updated "truths" only to have truths change yearly. Makes me wonder what truth is other than what's said the most. There is no reason to firm up an opinionated position (as evolution is) in a "maybe" just because it's the most popular viewpoint. History is riddled with these types of mistakes. No one will ever know for sure so believing in evolution as the source of life on Earth and its diversity, as much as non-believers may try to argue to



the contrary, is as much about faith as is, say, creationist's theory or seeding theory. \*I don't have time to research all the sources again (I am a teacher after all), but they are there if one looks for them.\* We are told to keep an open mind in so many aspects of life, yet the National Center for Science Education wants us to abandon an open mind and concede our (fact supported) faith to align with the "mainstream" faith position. I find this closed-minded and, frankly, irresponsible. It is necessary to teach and study evolution as 50% of Americans believe this as fact (without first-hand knowledge, BTW) and as such influences public policy, but to demand that it is taught as the only credible creation theory worthy of our endorsement is arrogant. I do not subscribe to the notion that I have to believe in evolution as the source of life's diversity just because it's the most publicized position, regardless of my religious preference. It's not about that. It's about trying to stay objective and accepting that there are things we just may never truly know. I love this about science, that some phenomena still make us wonder. That doesn't make any position more worthy of a permanent "standardized" teaching position than another unless our goal is to manipulate thought to align with one that is most palatable or secular by contemporary standards.

44. Regarding evolution, you should use the ASE standards that are scientifically accurate and appropriate for the grade levels. This ridiculous attempt to pretend evolution is not real is pandering to the lowest common denominator and religious bigotry. Even the Pope said evolution is NOT in conflict with religion. Stop this complete nonsense. Stop deliberately miseducating our children.  
The internal revisions have muddied up the standards in Earth and Space science. The "key concepts" look like you loaded a shotgun up with old PO vocab words and shot it at a page without knowing the content sufficiently. It is obviously unnecessary when the second "key concepts" is basically unused. There is also no mention of deep time, the age of the universe, or the age of the earth. Evolution also needs to be more prominent in any discussion of biology.
45. The standards on evolution have been dramatically weakened since these were last seen by the committee. While I was involved less involved in the Earth and space science standards, I thought there had been more emphasis on climate change. Both of these areas need to better reflect the scientific consensus and not the political climate.
46. As a 7th year science teacher I do not like how these standards are organized. Rich content was sacrificed for the use of cross cutting concepts which is what good science teachers are using already
47. Check content load on fourth grade. Add more content vocabulary and examples.
48. Please do not water down the evolution standards. By doing so, you decrease scientific literacy. There are 30 plus scientific organizations which have felt strongly enough about this topic to make public statements about it. I will be happy to provide you with references if requested.
49. Please restore original strength of evolution explanations. The diversity of organisms IS the result of evolution.
50. Until those changes are reversed, I do not think it should be adopted.
51. It will be nice to see the same adoption to standards for students in science as they have such benefits right now from the ELA and Math standards
52. They should leave the Science Standards as originally written.
53. The Board should seriously reconsider these standards because they do not accurately reflect where our science education should be heading. The goal is to move to a STEM-based learning environment and that is not seen in this DRAFT of the standards.
54. Listing key concepts limits the beauty of three dimensional learning. Teachers will see this as a checklist and this will discourage inquiry learning. I like the big ideas that were there originally, but adding the key concepts made the model look a lot like the PO model we had before.
55. The original standards with adaptations based on the overarching NGSS would be better. Not only was most of the content appropriate for the original age groups but the skills needed were more supported across other content areas.
56. I don't understand the ADE additions. Many of them make the science seem watered down or even incorrect. If these are removed, I really like the standards
57. Yes.
58. Definitely not
59. Unless there is to be a significant funding increase to schools to allow for purchasing of earth, life, and physical science curriculums for each of the middle grades these standards need to be revised.
60. See above
61. Taken in isolation, my reaction to these standards is favorable, but we do not live in isolation. There are already excellent national standards available, and Arizona should be adopting those, not

- reinventing the wheel.
63. The standards need continued evaluation from educators before adoption.
- I absolutely do not support these changes. I believe that education standards are a "living document" but they should not be gutted like this. Changes should be made to update for new technology or changes in a field. Not completely re-writing them because the new buzzword in education is "rigor". Rigor does not lie in the standards, rigor is taught in the classroom. It lies with the teacher and what they do with the standards.
64. It needs subtle changes for k-2 standards. For example, the first grade standards should all start with "With guidance and support..." At this age students need the guidance to help learn how to utilize their knowledge scientifically.
65. The changes that were made to 4th grade make a lot of sense. I like the incorporation of the science and engineering practices, because they mirror the mathematical practices that we are already referencing with our students.
66. The State Board can adopt this Draft as long as it is understood that this draft needs revisions made by educators and further work before it can be implemented.
67. I believe this DRAFT should be adopted.
68. The standards as they are in this draft are not in the best interest of Arizona students. The placement of the standards in the new grade levels are not appropriate to their development levels and do not match their understanding on the needed math standards.
69. There still needs to be minor modifications to verbiage and bridging between grade levels.
70. I think there should be additional language added to the standards so that each educator is teaching the same concepts. The way that they are worded currently allows for too much interpretation which will lead to inconsistent concepts being taught.
71. I would strongly agree if I were looking at the work the committee did. All ADE changes that the committee did not approve should be removed. I can not agree while those are still in the standards.
72. students are not developmentally ready to handle the physics portion of the curriculum, its was to vague, not meat and potatoes.
73. This draft has some good ideas, the introduction and appendices are well written. However, the language needs to be made more specific.
74. Standards are way too jumbled, and still the specifics of what needs to be taught under certain standards are unclear and need to be interpreted.
75. Agree but with further teacher/educator input
76. Question is how either the state and/or districts will help the teachers understand the meaning of the standards.
77. The new standards take science, which I care about, and twist them around without any thought to how it plays out long term. I feel I need to strongly voice my concerns to this and believe it needs to be revisited before being presented for adoption.
78. Should not adopt as is. Some revisions should be made.
79. There are many changes that need to be made before it is adopted.
- If we consider the essential standards only, then 3 years is enough to teach the students.
80. However, a student doing the three year only plan will not be prepared for any college based physical science course. To give them that preparation (the plus piece), a student will need to take multiple year's worth of science in their final year.
81. The citizens of Arizona deserve to see the draft as it was written by the committee not just how the internal review changed the document. The need for transparency is critical.
82. The state board of education should NOT adopt the draft standards as written. The state should stay away from creating a list of key concepts. A key concept list would be used by educators to develop their curriculum and many of the key concepts are not developmentally appropriate for the age group. The state should include a list of learning progressions that would help teachers guide the development of their curriculum.
83. The DRAFT standards are written in vague terms and the content is not developmentally appropriate for Kindergarten.
84. I think there's still so much missing.
85. Yes, these standards should be adopted.
- 86.

87. These are not what the committee created
88. Adopting this standard will continue to provide students with a general understanding of science and will call attention to the need for technology in science classrooms.
89. We feel that this draft will aid in use being able to teach our students in special needs the same as general education.  
Will the revision of the standards also affect the content of the science kits to a given district? For example, in Mesa Public Schools, the science kits to grade levels that go to all schools are aligned to the former standards. It would be logical that the kits would get updated as the science standards will be.
90. The standards will be built on in each grade level and will enable our students to have a more comprehensive understanding in science.  
As a teacher, I am excited about the opportunity these new standards provide for my students in the project-based, constructivist learning environment I strive to create in my classroom. The three dimensions (crosscutting concepts, core ideas, and science and engineering practices) synergize to allow students to engage in the real work of science, not just learning a collection of facts, or following a "cookbook" style laboratory procedure. By thinking about the crosscutting concepts while enacting the science and engineering practices in order to understand the core ideas, students will develop a truly deep knowledge base about how the natural world works, what science is, and how science is done. Furthermore, the new standards give decision making power about sequence, importance, and class structure back where it should be, in the hands of local districts and schools. Therefore I support the State Board of Education adopting these new stands with some moderate revisions.
91. The original draft was painstakingly developed through an open process by the Arizona Specialist committees consisting of 100s of experts and educators. The AZ Dept of Ed made changes in a closed process. The big ideas of science education were arbitrarily changed and now lack the rigorous review that originally developed them. The insertion of a key column concepts once again returns classroom teaching to factoids rather than developing Arizona students into critical thinkers.
92. Make some the plus standards essential.
93. I strongly agree with adopting the version without the ADE changes. If those are removed, this would be a great standard.
94. More emphasis needs to be placed on Space systems in the elementary level.
95. The new standards better scaffolds learning which makes it better for standards
96. I feel that after changes are made, this draft should be approved.
97. Perhaps too wordy and ambiguous for a new teacher to understand the simplicity or ways to teach. Science is scary to some educators especially in early childhood.
98. I'm glad for the revising, but it needs more revisions  
I would like to say that the solar system is a very complex issue for a 6th grader to truly comprehend.. I think that the solar system should remain a 7th grade standard and that the current format of the students learning about the micro (earth science) prior to the macro (astrology) is a much more suitable standard than the proposed change.
99. I recommend revising instead of adopting.
100. The proposed new one is obviously flawed. Keep the old one. I don't know how that could be much improved. Certainly the proposal doesn't do it.
101. We are separating from the national standards? Is this correct? I am not sure if this is such a smart choice, when national standards do exist.
102. Please continue to revise these drafts.
103. fdsaf
104. Let's roll this out!
105. No, why were the originals changed? There are too many inaccuracies that need to be discussed and changed. I am VERY CONCERNED about the lack of transparency in the internal review process.
106. Many revisions need to be made before these can be adopted.
107. I believe that there are extensive revisions that need to occur before these standards are

- implemented.
111. I would prefer an implementation of the NGSS standards that most states are already implementing.
112. I think as long as you do not try to assess these new standards with the old assessment (AIMS or other standardized testing) that these standards will work well. If you do not change the assessment this transition will fail miserably. The biology AIMS requires us to cover too much information too quickly, without depth and/or understanding on the students part.
113. Some of the internal review additions are not in sync with the basic format of the new standards which is refreshing and operational in the use of "big ideas". Like the old weak standards and AIMS test the independent review added random ambiguous facts and terms which are never retained by learners.
114. I have pages and pages of comments on this - I will put them in at each grade level.
115. We feel it is important for our many military students to have a science curriculum which is more in line with what they learn in other states. We would like to see a closer relationship with NGSS.
116. I would strongly agree if all of the ADE additions were removed. Many are incorrect science or inappropriate for the grade level
117. I think this draft looks great.
118. Same as stated previously. I would like to see the 8th grade standards focusing on the physical science and life science standards. I would like to see the 7th grade standards, on the other hand, focusing on the space and earth science standards and life science standards.
119. Sure
120. At this time, the DRAFT should not be adopted as the Arizona Science Standards. Both students and teachers need to see another draft that offers further explanation of what is expected to be taught. I believe offering in depth standards offers a better experience to students, rather than offering broad standards. If broad standards are used, students may not be learning the same things across the state.
121. I feel just a step by step of what prior knowledge is needed would be best for each standard.
122. Engineering and physics needs to stay in 8th grade.
123. Prefer we adopt the NGSS.
124. With appropriate revisions and cross content support, yes.
125. It appears that many of the current 8th grade standards have been moved over to 7th grade. Why? 8th grade should be doing physics. It more closely matches the math curriculum.
126. The cost to schools.
127. Our team asked if the new adaptation would be the responsibility of teachers as of August of 2018 or will it be rolled out in August of 2019?
128. The only item I would comment on is a strong urging of the state to adopt the Next Generation Science Standards (NGSS). I don't see any reason why such a rigorously reviewed set of standards that have been adopted by other states could not also be used here. This seems redundant and shadowing the efforts already completed. I support these if they were the only offer. As I higher priority, I support adoption of the NGSS.
129. What is the timeline for this adoption? Is there a target date or intended date of implementation in the public school system?
130. Concern: AIMS is Still Being Given as Assessment in 8th Grade, but 8th Grade Standards have been changed in new draft.  
8th grade teachers are concerned since the new 8th grade standards do not include physics and additionally include old 7th grade or below standards, yet the AIMS will still be the state assessment being given until 2020 or later which is on completely different standards. Therefore, 8th Grade teachers will not be adequately preparing students to take the AIMS if they are solely teaching the new standards

#### Solution: Rolling Adoption of New Standards

Due to continued AIMS testing, 4th and 8th grade teachers would not immediately adopt the new standards. They would continue teaching the old standards to ensure that their students would perform adequately on the AIMS which is based on the old standards. After the new standards have been utilized in K-3 and 5-7 for two years, the students would have had enough time learning the new standards at the correct time, that the 4th and 8th grade teachers could then begin transitioning.

Research Supporting Concern/Solution:

As stated in A Framework for K-12 Science Education, "...various forms of assessment should all be linked to the shared goals outlined by the framework and related standards..." (pg.261). That is an assessment of any kind needs to be related to the standards. Keeping an assessment for old standards does not fulfill this goal.

131. It depends on if a pacing calendar will be provided and a sequence. Will resources be provided to supplement instruction? Science kits?
132. I strongly feel the science standards should not be changed as they are currently shown in the 2018 draft.
133. I believe they should not adopt them but revise the standards now to create more depth and rigor.
134. It should be adopted.
135. I would support the original draft that was developed by teachers prior to the internal review, but NOT the changed version! Please see my prior comments.
136. They actual standards are fine they just need to reorganize the standards for middle school. This way students and teachers can go more in depth for science knowledge.  
A specific area of concern is the addition of a column of "key concepts" to the standard's detail. This addition has implications for interpretation of the standard. The key concepts are listed only as simple terms, without connection to the cross-cutting concepts or the science and engineering practices. This will shift the teacher focus from rich connections in the standards themselves to a simplistic list of content-only terminology.
137. I don't appreciate some of the "internal review" changes that were made, especially noticed it in the evolution section.
138. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
139. I feel the draft should be adopted. The standards are in line with standards utilized across the nation so students receive comparable education and can be competitive beyond the secondary level.
140. Arizona should adopt the Next Gen Science Standards to standard education with other leading states to improve opportunity for our young students and local and global economy!  
The introduction of "key concepts" effectively recreates a performance objective (PO) based set of standards at its best, and borders on a state mandated curriculum at its worst. This specifically goes against the instructions to, and, intent of the committee. The key concepts become simply another checklist for teachers, restricting and confining instruction and assessment, and keeping them from getting to the deeper levels of understanding required for effective science teaching and learning. These standards should NOT be adopted without the deletion of the "suggestions" made by the internal review committee which did not adhere to the transparency protocol.
141. Please consider putting inquiry back as a standard!
142. See comments above!!  
Grade 6 needs to be addressed as it has 16 standards compared to an average of 10-12 for other grade levels. When one begins to unwrap those standards, there are numerous learning targets. There will simply be too many learning targets to effectively teach to the degree of depth desired.
143. Reeves (2002) suggests having no more than 13 power standards to determine what is most important. This, in theory, means three standards in 6th grade may not be addressed ever.  
Reeves, D.B. (2002). The leader's guide to standards: A blueprint for educational equity and excellence. San Francisco: Jossey-Bass.
144. The rigor is well written. The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.
145. When you remove life cycles and habitation of animals, you also remove the intrinsic motivation to understand why it is important to protect the planet, invest in recycling, and understand the impacts to our environment. There is a lot to fit into one year if we expect them to master all standards.
146. I feel like it needs more detail. I do not think it should be adopted at this time.
147. i feel like implementing human development should not be part of the curriculum and i feel like it would be introducing it at too young of an age
148. There is a lot of information and it needs to be looked at.
149. I think needs to be more conversation on grade level topics.



151. There still needs to be multiple conversations had about grade level appropriate topics.
152. Knowledge taught without teaching conjecture is a great thing.
153. No, I don't feel it is strong enough to be adopted at this time. It needs MORE details.
154. I understand that the standards are what drives the instruction and that we, at an elementary level, are an important step in preparing the students for the next grade and ultimately for years up to 12th grade, but I don't feel very knowledgeable about how to work with the new standards. Yet.
155. I agree that they should adopt these new standards
- The Arizona State Board of Education should adopt this draft to increase student achievement and help teachers incorporate science standards into ELA and math curriculum. It will also prepare students for High School.
156. help teachers incorporate science standards into ELA and math curriculum. It will also prepare students for High School.
157. yes I believe they should adopt this draft.
158. Not until we have funding to get the resources we need to teach them.
159. Please take out the key concepts!
- I like this draft of the new AZ standards but for Kindergarten, clarification needs to be given as well as examples, as to how to teach about vibrations and designing and evaluating a tool to "extend the senses."
160. as examples, as to how to teach about vibrations and designing and evaluating a tool to "extend the senses."
161. Please adopt the Science Standards as written by the 111 Science Specialists who devoted their time and energy to improve Arizona's educational objectives.
- NO:
162. Why reinvent the wheel? The NGSS standards are already done and are currently being taught in multiple states with success. It just makes sense that we adopt those standards.
- With the ADE additions and changes, these standards should never be adopted. If the ADE additions are removed (especially the Key concepts, they connections to other content areas, and the scientifically inappropriate revisions to evolution standards and big ideas), then the standards need only minor revisions.
163. scientifically inappropriate revisions to evolution standards and big ideas), then the standards need only minor revisions.
164. Take the time to purge any semblance of Common Core, the jargon, etc. out of it, and return to the simply stated principles of science that have always been taught. Teach the scientific method.
165. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
- This draft needs a lot more work. More use of spiraling, or systematic deepening of science concept content, should be included. Science practices, while important cannot replace foundational concepts/theory that need to be built upon and reinforced throughout the grade levels. The once-and-done approach is not sufficient for quality science education.
166. As I stated earlier there are areas of concerns that need to be address before adopting these standards.
- For example on page 2 - the paragraph at the bottom in green, the explanation I feel is inaccurate....I would recommend changing this to say something like "Patterns are a crosscutting concept found through all science disciplines. An example is how scientists use patterns to classify objects based on their similarities and differences. Another example is how engineers use patterns to determine the demand for electricity and demand on the power grid."
167. Patterns observed are used to build a classification not the other way around.
168. Terms such as scientific method needs to be stricken from this document since it was not in the 2004 standards and we are rolling back science education to the 1950's with this type of thought process. Using research documents such as the K-12 Framework for Science Education should continue, and non-experts should not be allowed to make wording changes as those changes drastically alter the meaning to any given statement. For example, there is a huge difference between "Crosscutting concepts cross disciplinary boundaries and provide an organizational framework..." changed to "Crosscutting Concepts cross boundaries between science boundaries and provide..." This change modifies the meaning. There are science concepts that cross not only science but also use the skills of math and language and support the doing of science.
- Changing Investigate how senses and can detect light, sound, and vibrations even when they come from far away; use the collected evidence to develop and support an explanation.
- TO "Investigate how the five senses and their associated body parts can detect light, sound, and vibrations even when they come from far away; use the collected evidence to develop and support an explanation.
- CAUSES: Kindergarten children will need to be able to explain how the eye, ear, nerves, nose, taste buds work which is developmentally inappropriate.



- These are a few examples of why this document with the internal changes should not be adopted.
169. I like current standards...I think it is best for students to have 6th grade mostly weather and life science, 7th earth sciences and 8th physical sciences
  170. Do NOT dumb down the teaching of evolution for our children and state! This isn't at all acceptable.
  171. the evolution section needs to be strengthened and improved
  172. I am wondering if we will be given a curriculum to use so that I can teach these new standards?
  173. I believe everything in green needs to go or revised.
  174. Some modifications needed.
  175. I agree with the new science standards for physics.
  176. There are some major content mistakes. It would not be good for our students to teach them incorrect concepts.
  177. Please accept the initial revisions, NOT Diane Douglas's revisions.
  178. The Board should work with the committee to ensure that changes made during the internal review did not contradict the original goals.  
The draft removes the word evolution. Evolution is a major concept and scientific theory that needs to be taught. Even if people with creationist background disagree they need to understand how common medicine is creating hardy species of bacteria.
  179. be taught. Even if people with creationist background disagree they need to understand how common medicine is creating hardy species of bacteria.
  180. Diane Douglas' changes need to be reversed.
  181. We are setting our students up to fail  
HUGE CONCERN  
In the Evolution standard for life sciences the word 'evolution' is crossed out twice. I think that is a serious edit to cross out the word evolution in the evolution standard. I'm a little shocked to see this in 2018. Evolution is a HUGE part of biology and should not be something to fear....especially when knowledge of mechanisms of biological evolution are helping to create so many life saving medicines and helping us to understand biological life. We really need to get over seeing this word as a threat.
  182. I do not feel that the content taught at each level needed to be changed.  
The edits proposed by Douglas' "internal review" should be dropped and we should return to the previous draft written by science education professionals.
  183. I do not feel that the content taught at each level needed to be changed.  
The edits proposed by Douglas' "internal review" should be dropped and we should return to the previous draft written by science education professionals.
  184. This version, as currently written, should not be adopted.
  185. No
  186. The deletion of evolution and Big Bang theory need to be included in these standards  
I am completely appalled that words as such as evolution and the Big Bang theory have been crossed out. These are SCIENCE standards and therefore should be based on scientific research and the most current, evidenced-based understanding of science. These words need to be restored to these standards.
  187. I am completely appalled that words as such as evolution and the Big Bang theory have been crossed out. These are SCIENCE standards and therefore should be based on scientific research and the most current, evidenced-based understanding of science. These words need to be restored to these standards.
  188. Not until Science standards include Scientific terminology including evoyand the Big Bang Theory.  
Taking out Evolution and the Big Bang theory just makes NO sense whatsoever. Again, let actual scientists and science teachers write the standards, not bureaucrats who know nothing about science and don't believe in established scientific theories and FACT.
  189. Please include the Big Bang and evolution back into the standards draft.  
The science curriculum should be revised to include evolution, Big Bang theory, and all other science related topics that are missing due to religious bias. These are science standards not theological studies.
  190. Should be adopted, with slight changes made.
  191. This is 2018, correct? Do NOT remove evolution! No NOT take out the effects fossil fuels have on the environment! I'm extremely bothered by this draft. It needs to be changed.
  192. Please see number 11. Get some real geoscientists and real geoscience teachers to review this document!
  193. Please see number 11. Get some real geoscientists and real geoscience teachers to review this document!
  194. Please see number 11. Get some real geoscientists and real geoscience teachers to review this document!

195. Science standards need to be based on scientific research and the standards adopted should be created by experts in the subject - science educators. Removing science based language is a direct violation of academia, and reduces the ability of students to build critical knowledge for this essential area. Our country was once a leader in science. That was due to following experts in the field, people who have done extensive research, basing knowledge in reality rather than in theological, faith based ideals that are not backed by facts and research.
196. I refuse to allow this to be the outline for my children's learning and will happily tell the superintendent about my thoughts on her inexperience with education.
197. What has happened to the separation of church and state in AZ. You must present the scientific facts and not talk about Devine creation
198. Drop the religious ideas, put back the science!
199. It does not serve the needs of our students to withhold information from them
200. After modified to take out specific theories and opened up for children to explore theories as a whole not limited to "big bang" or evolution.  
The original draft is an excellent version of new standards, but I do not agree that the standards should be edited to remove key science concepts. Specifically the removal of the terms evolution, and the big bang theory that were removed from pages 44, 62, and 69 in the internal review version of the draft.
201. The original draft is an excellent version of new standards, but I do not agree that the standards should be edited to remove key science concepts. Specifically the removal of the terms evolution, and the big bang theory that were removed from pages 44, 62, and 69 in the internal review version of the draft.
202. Why on earth have you removed references to evolution and the big bang theory???
203. The draft edits need to be changed back to the original form. There is no room for church in a classroom. That's what churches are for.
204. should not adopt them, too many revisions are needed.
205. Trust the scientists community and let them write this without changing anything.  
It's the same group of people that, every day, save your life and your family and friends life.
206. They are biased by not crossing out accepted scientific theories such as Big Bang and Evolution.
207. The National science education standard are better.  
The original standards as created by the Science Teachers is very easy to read and easy to understand. It covers what our children need to know. I STRONGLY DISAGREE with the editing taking out evolution and Big Bang Theory from the high school science curriculum.
208. Words like evolution look like they are being taken out. Which is ridiculous when in the context of science. Evolution means change over time and should be include. Also, I notice the word core being replaced be essential. Core concepts have been used in education for decades. Replacing it with essential not only is absurd but unnecessary. Core literally means an arrangement of a course of studies that combines under basic topics material from subjects conventionally separated and aims to provide a common background for all students. Changing this word because it makes someone uncomfortable means they need to be educated.
209. Here are the sections I am concerned about, highlighted by the changes on of 69. First, biological diversity is NOT the same thing as evolution. Second, the scientific community has very strong consensus that evolution is the process that results in biological diversity. By adding "may", it implies doubt that doesn't exist (without additional empirical evidence—by nature, scientists always doubt). Third relates to the first: "change in genetic composition of a population over successive generations" is not the same thing as evolution. By watering down the language and the concepts taught to our students, we are leaving them unprepared for the rigors of real science.
210. I don't think you should completely move areas to different grade levels. The standards we have now in second grade are very age appropriate. If the students need to test and evaluate what heat does is the state going to provide "heat" sources for the students to use? Why did you move the human body organs to third grade? I've taught many different grade levels. Human body should stay in second grade!
211. Needs to include specific wording of evolution and its role in life's biodiversity.
212. I only choose Disagree because of what seems to be a strong theme of "not talking about" evolution concepts and adaptation to environment. allowing students to argue for or against what is scientifically proven is not constructing deeper understnaing, it is fostering a belief that irrefutable fact is refutable! Since this "theme" seems to rampant throughout the document, I feel this, in whole, needs to be revamped.
213. I disagree with Ms. Douglas' strikes of any language pertaining to evolution. While I understand she has her own beliefs, it is wrong of her to push those onto the public. I am a science teacher with a
214. I disagree with Ms. Douglas' strikes of any language pertaining to evolution. While I understand she has her own beliefs, it is wrong of her to push those onto the public. I am a science teacher with a

- degree in Geology and therefore well aware of the "theories " relating to the formation of our planet and evolution. I also am well aware that when the uneducated people hear the word evolution they immediately think of monkeys to humans. However, evolution is not limited to that theory alone. Evolution simply refers to species changing over time which is ongoing. It's wrong to eliminate that from the standards. Students need a full understanding of how variety occurs among the living on our planet whether it be humans, plants or animals.
215. Church and state are separate entities for a reason. This is not the platform to insert personal belief over scientific reason. Revise the document to include evolution and the big bang theory otherwise you are doing a disservice to the children. Let the church preach creation as much as they desire. This is not the place for it.
216. The draft MUST go back to the working committee before adoption.
217. The standards should not be adopted as long as there is a "key concepts" list, evolution being so light in the standards and the difference between 'essential' and 'plus.'
218. How did we (and the rest of the baby-boomers) ever get so much science knowledge without such "Standards" like this? When we were taught the basic information from grade 1?
219. There is no mention of the scientifically accepted concepts of evolution or natural selection. These are core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.
220. Based on what I have seen I would have to say this is not really an improvement and will lead to confusion. Also, while I think Math, Language Arts and Health are important I also think that Science is important. Science is not parsley garnishing the plate. Science is at least a side dish on the plate. It is not here to bolster somebody's standardized test scores in Reading, Math and Writing. After having been asked as a Science teacher for 12 years what I was going to do to help my Math and Reading colleagues and then have the test canceled in February by unresponsive legislature I have had enough. Science needs to be a priority. Thank you for allowing me to have some input. Please know that I have 25 years experience teaching, 24 of which are in the classroom setting. I have taught in 4 states, 6 schools and across all grade levels (k-12).
221. At present the State should not adopt these standards until the ambiguity of the standards have been corrected.
222. I feel like these standards need more work.
223. I would be in favor with the shift of universal gravitation to later years.
224. I would accept this draft for 4th Grade science.
225. Put it back to the way it was before your green revisions. Stop being politically correct and let the science teachers teach science. Let the kids learn how things work and form their own responses and reasoning based on evidence, scientific research, and data. Let us teach the kids how to be critical thinkers and independent problem solvers.
226. This draft should not be adopted. By forgoing common scientific ideas such as the Big Bang Theory and theory of evolution, students will be at a huge disadvantage.
227. Not without revisions to provide greater clarity.
228. No, not until it teaches what the rest of the developed world knows is scientific fact.
229. Revisers should take another look at the earth science standards-- what is the underlying objective and how to get students there. Take advantage of the expertise we have in state at UA and ASU as well as your earth science educators. A good start but needs much work. Also, are we talking a separate earth science course by Junior year, or a set of 3 years of integrated science?
230. Stop removing the word evolution and Big Bang. Those strands are watered down and do not reflect the current scientific community's view on the topic. Science is ever changing; you can have debates while still using the correct terminology.
231. I am concerned that the content of the standards have changed so much that we are now lacking materials to teach the standards. As of now, I will be teaching using the new standards while also using the old standards to fill in the holes.
232. I believe the original draft was a good set of standards. The current draft with the internal revision notes and additions is a step backwards from what I (as a science teacher) would like to see in standards.
233. I believe that the draft should be adopted after it is organized in a more student/parent/teacher-friendly way.
- I also agree IF the standards fall in line with the AZMerit Testing. If the standards don't correspond to the standards in the AZMerit test, then I disagree/disprove of the new draft.

234. It is an absolute waste of resources to recreate something that is already well put together and proven. Making our own standards does nothing but waste money in both the creation of the standards but all the materials that need to go with them. Adopting the NGSS will also come with some of the support teachers will need to start integrating standards because it already exists.
235. Please go back and pay attention to national standards and adopt them. Please listen to what educators advocate for.
236. While the practicing of politics seems to be inherent to the human condition, science is founded on objective rather than subjective pursuits. The training of students must thoroughly incorporate the critical underpinning of non-biased thought and action in the scientific endeavor.
237. As a former educator and a concerned parent, I strongly oppose this draft of the AZ Science Standards. Please go back to those in higher education, reply on their expertise, and re-write these standards to align with NGSS. There are a number of projects currently underway that will provide free curricula to teachers based on NGSS. If the AZ standards do not align, teachers in AZ will be left where we currently are - without effective curricula.
- I think the board should seriously consider not applying the edits proposed to the last draft, many of which were clearly not made by scientists. Seems like politics are creeping into our science curriculum here. States and Countries that teach proper science will outperform places where politics is allowed to water down our education. Please consider the impact on an entire generation if the truth is hidden from students due to selfish political or religious convictions.
238. It took 350 years for the Catholic church to realize they wronged Galileo, please do not make the same kind of mistake here. I think the church rather owed an apology to the 10 generations they deprived of the truth and quality of education.
- Please take the advice of real scientists when it comes to science standards, this is more important than people would like to believe.
- I work in science every day, I am an engineer and scientist and we are finding it increasingly more difficult to find good candidates for our company from American schools. The impact of watering down of the science curriculum is already evident, please be part of the solution and not part of the problem here!
239. No.
240. Make scientific study more robust and do not water down evolutionary concepts at all.
241. Again, teaching for knowledge retention is key, BUT, teaching useful knowledge is better retained. Tests are necessary to determine if concepts are understood, but basing teacher performance on how well students test defeats the process of learning other than for students to test well so that teachers can advance.
242. I think the key concepts need to be removed and the choppy nature of the standards need to be addressed. Also, the breadth needs to be narrowed so that we are able to teach with a greater conceptual understanding.
243. The Arizona State Board should not adopt this DRAFT.
244. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
245. I am very disappointed in the draft of these proposed science standards. Please reconsider the addition of the key concepts.
246. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
247. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
248. Revert back to the initial document that the committee submitted to you. Its undemocratic and un-American to have a government department offer a terrible alternative and then authoritatively enforce its adoption.
249. The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.

250. No, you need to have both expert scientists and a committee of science teachers review and revise these standards thoroughly so they make sense for implementation.
251. We need to remember the separation of church and state and not remove words like "evolution" and "big bang theory" to satisfy someone's religious beliefs.
252. The draft needs to be returned to the form that was originally submitted.  
Department staff deleted or qualified the word 'evolution' throughout the document."  
  
uphold the integrity of science education in Arizona?  
  
threat to the integrity of Arizona's science standards
253. I am calling for the restoration of the Association for Science Education's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the compromised description present in the draft (as L4; see p. 79) in the draft standards;  
recommending revisions to the treatment of evolution and allied topics in passages that seem to have been similarly deliberately weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in 8.L4U2.11 and HS+B.L4U1.19, the failure to use the e-word in 8.L4U2.12, HS.L4U2.31, and HS+B.L4U2.20, the omission of the Big Bang in HS.E2U2.17).  
I teach AP Biology and if you take out evolution from the standards - you've taken out one fourth of the content for the AP Biology Exam. In addition, the big bang is also one of my standards. Why the anti-science take on science standards? Evolution and the big bang are very real theories and that is our job to educate.
254. I want real scientists, including those in industry, to have a larger voice in this.  
There's needs to be less editing on the Theory of Evolution portion of the standards. The way it is worded now will give students a significant disadvantage because they will not be able to truly and completely understand biology without understanding that everything in biology is directly related to evolution. Please revise the standards to portray the importance of evolution, as it was originally submitted.
255. It's fine.
256. Keep evolution in our schools, we are doing a disservice to our children and they will be left behind in the scientific community by removing these basic ideas.  
The deletion of basic widely accepted scientific principles is in direct opposition to promoting thorough and well documented science facts and curriculum. Incorporating ideology into the science standards is COMPLETELY UNACCEPTABLE. These changes are antithetical to the core of science education FYI- I'm a National Board Certified Teacher, Biologist and Field Scientist and College Professor. I reject this document as a distortion of scientific facts and thereby unacceptable and falling below the standards that should be addressed in the curriculum
257. This draft needs moderate revisions to reinstate the use of the word "evolution", as this IS the prevailing scientific theory and to reinstate the words "scientific method". I object to the veiled attempt to thwart science in favor of religion.
258. These are SCIENCE STANDARDS and it appears that religious doctrine has interfered with truthfully discussing Evolution!
259. As a parent, I cannot support standards, no matter how well written, that omit basic scientific knowledge. Stop preaching your religion by default. It's in breach of church/state separation.
260. No - evolution is fact based research and needs to be taught as such
261. Obviously, the text which waters down and dilutes the theory of evolution in any way should be removed. Let real science teachers create the standards- not religious groups.  
Evolution is universally accepted among professional biology researchers. Science education standards emphasize learning the process of science and especially scientific inquiry. Studying evolution helps students form useful answerable questions in a subject that continually proves itself.
262. No.
263. I don't think you should remove the word evolution. It's a term used in science all over the world and it needs to be included in the science standards.
264. With out revisions, no they should not be adopted.
265. Modifications that diminish accepted standards of scientific reasoning should not exist.



- Category L-4 should not exist. It is non-scientific  
Eliminating the term Scientific Method is ludicrous.  
Should not eliminate the term Natural Selection.
270. Revisions should include the information about evolution and ensure that the content is presented accurately for teachers and students alike.
271. The recent edits to the draft are incorrect and misleading.
272. TEACH EVOLUTION!!!
273. A lot of time went into creating the NGSS standards. I feel it is important to "not re-create the wheel"
274. (Please see comments for #13)
275. If you do not include the words Evolution and Big Bang, they are not science standards, they are just opinions from uneducated people.  
Teach evolution and medically-accurate, age-appropriate sexual health education. Leave theology and religious doctrine out of science classrooms. We need to educate our children to be scientifically-literate with facts, not with mythology.
276. Downplaying the FACTS of EVOLUTION is not "science." It is not your job to advance the religious nonsense pushed by the AZ Republican Party. Your job is to make certain FACTS and SCIENCE are taught throughout AZ's PUBLIC schools. Parents who are made sad by science & facts may place their children in PRIVATE, religious schools.
277. The State Board should not adopt ANY draft that was not written by Arizona teachers for Arizona students as per their directive. Drafts that have been "internally reviewed", had scientific theories removed, and contain inaccurate information should not be adopted.
278. The removal of the scientific theory of evolution is disgraceful. A scientific theory is not a random idea, but is a concept for which extensive research, study and evidence exists. One person's religious beliefs should not influence the course of study for a generation of students in a state. Additionally, the removal of the Big Bang and the creation of the universe is unacceptable.  
The removal and re-wording of the "theory of evolution", as currently proposed, is clearly an effort to downplay and minimize a well supported scientific theory. With no other scientific theory (such as but not limited to magnetism, gravity, and so on) are they presented as if there is argument to the truth and validity. However most mentions of evolution hands been changed to an increase of diversity or other language, and where it's left is as stated before, an attempt to minimize the scientific consensus. Arizona school children deserve better than that.
279. These standards need a lot of work still. They are not nearly ready to be implemented. Please rethink this.
280. NO. Absolutely not. IT is absurd.
281. The standards need to keep evidence based scientific theories and language, such as evolution.  
There are definite political agendas being adopted in this draft. The obvious one is the exclusion of the theory of evolution at all levels, watering it down to meet a religious objective. As a highly religious and scientific person, I find no conflict in the two views as they are representing completely different ways of knowing (strict observation and physical evidence vs. spiritual confirmation). The not so obvious one is the subtle reforming of human impact on climate change and species survival (and even product making) to the less innocuous "positive and negative" wording for everything from ethical dilemmas to manufacturing. That is a blatant misrepresentation of the massive overuse of limited resources that our nation seems to deem theirs by birthright. Our children deserve to be taught the proper responsibility for resources so that their creative minds might solve those problems that we've left them!
282. The entire evolution section needs to be back in its earlier form without the edits that remove terms and dilute the content.
283. The draft needs to go back to working committee before adoption to revise changes from the internal review.
284. It is much better than the 21004 standards.
285. Not with the cross-outs I see.
286. The draft's language on topics related to evolution are not acceptable.
287. Keep Diane Douglas out of this process!
- 288.
- 289.



290. It is impossible to have rigor and adequately prepare students for higher education and the workforce without fully acknowledging science and the accepted and established role of evolution. How can we compete in the global economy when beliefs are substituted for academic knowledge. You do not need to hide, protect or sneak in the truth. Critical thinking and the standard of science will enable students to discern the truth. Separate your church from my State. Exercise complete freedom of thought in your church and home. Don't dilute my science.
- The standards adopt the philosophical position (methodological naturalism) that natural explanations can account for all aspects of existence and the universe. This is an unproven assumption, not based on evidence. Students should be told about teleological (design) alternatives as explanations for the origin of the universe, of life, and of life's diversity.
291. Absolutely not! When our funding is lowest, why would it not make sense to have one concept taught per grade level... go back to the way it used to be before the state tore apart science learning. My students used to be able to go deep on knowledge and have better conceptual learning. Students now have no recall of concepts learned over a year in between concepts, and you want them to build lasting knowledge on something they can't remember. Tearing concepts apart further does not service our students nor teachers!
292. The concept of evolution is essential to include in the life science standards! It cannot be removed.
293. I am glad to see in the second grade curriculum L4, requires introducing the theory of evolution. That is a very appropriate age at which to introduce that concept.
294. Throughout the standards, it appears that evolution has been omitted or downplayed. The current standards don't do that, and I think the draft standards should include evolution in the same way that the current standards do.
295. Removing the word evolution from the curriculum but having it as a core topic is irrational. Evolution is change over time, which science has clear evidence to prove that species have indeed changed over time. In fact some of the key pieces of evidence scientists use are seen in the key concepts section ( homologous and vestigial structures.) I understand that there is much controversy over evolution, and that simply is do to the fact that many people are uneducated on what evolution truly means. Evolution does not suggest when and where life began, it only claims that life has changed over time. So by removing the word evolution from the curriculum, would only add more misconceptions to our students thinking.
296. Do not remove references to evolution and natural selection.
297. Evolution is researched and proven and this is ridiculous that I even have to respond this was on a public form.
298. My one concern is identifying testing topic focus or testing limitations in order to allow all schools to be adequately prepared.
299. I feel this needs to go back to the drawing board, and include options for teachers from all areas of the state to be included, not just PHoenix area. Setting meetings and trainings up that are too far for us to travel to really is not balanced or fair way to write STATE standards... you are getting the input from too small a group, and leaving little choice or option to school districts on how to plan for the costs of changing things so much in some grade levels...
300. Case in point. Our schools do have textbook resources still that do have value, and materials for science are costly and buying is done year by year, little by little. To quickly have to switch some content around to a different grade level is going to leave schools without basic needs for experimentation in new content for several years to come. I have been teaching astronomy for more than a decade, all those supplies will no longer be needed in 7th grade. But I am just one teacher, and there are at least 6 elementary schools teaching 6th grade, and over 12 teachers... how do they get enough supplies to teach, when I am only 1 teacher of 3 teaching 7th grade science in our district... And 7th grade is going to need resources for weather and atmosphere..which has been at 6th grade level. We have no idea if they have kept the textbooks in good order, or have any supplies for that to move up to our school...
- Those types of orchestration of current resources is going to be a very difficult thing to plan.... add to that the fact that teachers do spend their own money on items, now all the money I have put into Astronomy supplies and resources I am not needing anymore...all the grants I have written and won for specific equipment and supplies.
- It is extremely frustrating to see such a content switch at one grade level, when others do not seem to have been moved around as much. THough I did not look in detail at all grade levels, so that may be because I focus on 7th/8th at my school that I noticed the changes in the two grades were different. 8th has not had much changed at all at their level in content, just in focus.
301. No. Fix the issue with evolution being striked from the 2004 standards. Return the subject to the requirements.

302. considering these standards will likely be tested, and from what I hear it will be a "grade band" test, I think they will lead to a lesser comprehension of scientific principles and lower test scores due to the issues noted in my response to question #15:  
I strongly dislike the spreading of scientific principles across grade bands in hopes that a) students are enrolled in a school in Arizona with our standards, b) there is similar pacing within and among districts to ensure that students who move within the state don't acquire gaps, c) all positions are filled by highly qualified teachers who will actually teach ALL standards with scientific accuracy and d) students will remember chunks of information from year to year to build upon.  
Also, if this is the angle we are moving toward, I feel like the state of Arizona should really develop a working relationship with the "Making Sense of Science" people to put all teachers through its curriculum in order to prepare for the changes in these standards!
- I will begin to repeat myself in other previously stated comments. PLEASE get rid of the the "knowing and using science", borrowed from the United Kingdom, the addition of the "key concepts" and instead more closely follow the language and intent of the new vision for science education laid out so eloquently in the "Framework for K-12 Science Education."
303. Omitting evolution is only hurting a child's education. It is absolutely absurd to remove even the word evolution when it comes to teaching science.
304. It needed more revisions and need considerations for some non-performing schools and schools with no materials to teach the standards.
305. evolution to stand alone; edit out "theory of" also; "traits within populations change through evolution" would make more sense...and "biological diversity as expressed through evolution"
306. I wish to leave the draft in the hands of true committee and untouched by politicians, including. Voss.
307. Again I reiterate that it does the students, and my children, a complete disservice by being so vague as to offer up to the table random thinking that has been proven false over and over again. I don't want my child to grow up using incorrect terminology and, in consequence, being taught being incorrect concepts about our world.
308. Please listen to the scientists. It's SCIENCE standards.
309. Scientists are no longer arguing about evolution. It is not a theory and as such should not be taught to our children as a theory. Trying to force religious material into science classes goes against separation of church and state. And keeps us behind educationally. We are almost dead last in education, maybe it has something to do with not preparing our students for the rest of the world.  
Absolutely not. FACTS BELONG IN SCIENCE. Faith based opinions are exactly as they are defined: opinions of FAITH—FAITH BEING that you are NOT SURE OF THE TRUTH, but BELIEVE SOMETHING TO BE TRUE WITHOUT EVIDENCE.
310. THIS IS SCHOOL, NOT CHURCH. We do not "need more Jesus" we do not need to "go back the the good old days".
311. You should be ashamed.  
  
You should NOT ADOPT THIS DRAFT of the AZ Science Standards.  
  
Shame.
312. No, it is a step backward. "Theory " of evolution... come on now
313. As sent by the 111 science specialists in November 2017 (left unchanged).
314. Absolutely not. There is a religious agenda here.
315. No! The changes are unacceptable. Stop dumbing down our children!
316. I think you should update the version 2018 draft. Either some of the original terminology from the 2004 draft or update the terms to a more scientifically accurate information.
317. See my previous comments. This draft is unacceptable. Roll back the changes to the sections that refer to evolution and related concepts. Only then will it be an acceptable set of standards.  
Because of the deliberate removal of evolutionary terms such as "adaptation", "natural selection", and "evolution" and the inclusion of blanket, non-evolutionary phrases such as "change over time" in place of the previous standards, this draft should NOT be approved. Hundreds of aspects in the sciences, medicine, and technologies rely on an evolutionary framework. Our students need to have exposure to and fully understand the established science of evolution. It is undisputed in all of science and it makes absolutely no sense to modify the language.
- 318.

319. Because of the comments above, these standards should not be approved. Scientists and academics would never champion the weak and muddled language I mentioned. Nor would they approve of the deliberate removal of core ideas in science. I certainly do not approve of the changes.
320. Scientific basis of evolution must be included with current redlines rejected. Although the number of changes is minimal the impact is major.
321. Please send this draft back for revisions and allow the actual science teachers to do their job to revise it.
322. The removal of vital information makes this incomplete and should NOT be adopted.
323. Needs to go back to review.
324. It is extremely unacceptable to weaken scientific principles of evolution and climate change, which have vast amounts of documentation and research to support them. Religious beliefs to the contrary should be strictly eliminated.
325. Do not remove references to climate change and evolution.
326. Evolution needs to be included.
327. This draft needs far more PARENT input!
328. The standards must be reviewed.
329. The previous set of standards included a list of science and education professionals involved in the development of the standards, however the current set of standards does not provide this information. There is no explanation of the methodology used to create these standards.
330. We need science based discussion of climate change and evolution
331. Science should be based on facts and not politics. Evolution should not be removed from the standards.
332. Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
333. Please leave our kids education to educators who created the original standards. The edits made to the ordinal are shameful. Diane Douglas' associates degree wouldn't even qualify her as a teacher yet she thinks she's educated enough to change the hard work of actual teachers. This is unacceptable.
334. No, for the separation of church and state issue as mentioned above. Science is science, religious teaching can be done at religious institutions.
335. Needs revision
336. This DRAFT of the AZ State Science Standards should NOT be adopted. Further meeting and discussion should be had with educators and people knowledgeable in the field of science in regard to climate change and evolution so the standards reflect accurate and educationally sound content, rigor, and depth of knowledge.
337. This is a failure to provide the children of the taxpayers and voters of this state the education they deserve and the board is required by the state constitution to provide.
338. Needs review
339. No.They should go back to the original recommendations as made by the experts, not the politicians.
340. It should be rewritten to include climate change and evolution. Both of these are good science topics that lend themselves to critical debate in the classroom for supporting positions.
341. Put Science back into the standards!
342. Not as written. Please address evolution and climate change as those in the scientific community do
343. DO NOT ADOPT THIS DRAFT! The draft presented to you BEFORE you illegally revised it is the one that TRUELY reflects the wishes of the board and the parents of this state. Why are you attempting to keep our students in the dark by pretending that evolution is an established scientific fact.
344. Must include evolution and big bang.

- Secretary Douglass must have her personal agenda woven into these ill conceived standards subjects
345. are being pushed down to younger levels that day become inappropriate to the mental development of children. Common sense and this science plan have nothing in common
346. Where is evolution?
- Overall the standards look sound, however, your treatment and weakening of evolutionary biology in the standards is very problematic. I call for the restoration of the Association for Science Education's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the current compromised description (as L4; see p. 79) in the draft standards. I recommend revising the treatment of evolution and allied topics in passages that seem to have been similarly deliberately weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in 8.L4U2.11 and HS+B.L4U1.19, the failure to use the e-word in 8.L4U2.12, HS.L4U2.31, and HS+B.L4U2.20, the omission of the Big Bang in HS.E2U2.17).
347. Evolutionary biology is among our most well documented theories in biology and is the fundamental principal that unites all other principles in biology. The fossil record along with genomic and other molecular data together irrefutably support the theory of common descent and the evolution of species through time. It would be a tremendous mistake and huge step backwards to describe evolution with such uncertainty and dilution. A solid understanding of the interrelatedness of all organisms and common descent are critical in modern medicine, antibiotic resistance and disease biology, biodiversity, ecology and many more fields in need of well trained innovative students.
- The current DRAFT refers to evolution in an unacceptable way (see comments above). This needs to
348. be changed if we are to appropriately educate students to solve future problems and keep the world a safe place (especially in Arizona).
349. All scientific theories should be investigated, including but not limited to, evolution
350. I am commenting on the DRAFT Science Standards from the Committee NOT as amended by the the ADE staff and Superintendent!
351. See my comment to question 15 above.
- It is imperative that the science standards include a clear teaching of evolution. It appears that this has been removed from the draft that is on the website. Evolution is a unifying concept that informs all of biology, from the functioning of molecules, cells, tissues, whole organisms, to ecosystems. Biological change through evolution is no longer a hypothesis; it is a well established fact supported by over a hundred years of research. We do our children and citizens a disservice if we do not educate
352. them plainly about evolution.
- See comment above. I was a professor in the Department of Ecology and Evolution at the University of Arizona for 18 years (until 2013), and I still feel a deep love for and commitment to the State of Arizona and its children. I have since moved to California where I am the Director of the Museum of Vertebrate Zoology and a Professor of Integrative Biology at the University of California, Berkeley.
353. With the change in the description of evolution, the board should not adopt this draft of the Arizona science standards.
- If you remove evolution from the Science Standards then they aren't worthy to be called "Science Standards". Stop making education a political issue. Evolution is scientific fact and must be part of any reasonable education standards.
354. Do not adopt this draft. Evolution MUST be included, not removed.
355. DO NOT accept the draft as long as it contains unscientific content!!
- Evolution is as close to FACT as the scientific community ever gets. Yes it's a "theory," but "theory" in a scientific context means "this explains all the evidence we have, and has made accurate predictions." It NEEDS to be taught in science class, and ridiculous fairy tales like Intelligent Design have NO place in our public schools. Why not teach astrology or alchemy as well? If ID is taught, should we also include the creation stories from hinduism, greek myths, etc? Teach SCIENCE in Science class.
357. Include both creationism and evolution in what is taught. Limiting it to only creationism needs to be proven that there is a god who created the universe to be accepted as truth over the other. Science is about fact. God is not a fact. It is a belief. Evolution has been proven time and again by what scientists find. Evolution should be included in the standards and the content!
358. Until the parts that have been watered down or removed (i.e. how evolution is treated) I cannot support this document from the perspective of a science educator in higher education. It would be important to know the rationale of why these topics were removed or generalized because it doesn't
- 359.

- make American education competitive with the rest of world. This kind of treatment opens the curriculum for other interpretations/beliefs such as creationism, astrology, flat-earth, geocentrism, the ether, and spontaneous generation. All of which are not supported in science because they lack evidence and merit.
360. Please do not pass this draft due to its severe lack of basic science. Evolution needs to be in the standards
361. No. Evolution is science. Adam and Eve are not.
362. The drafts need to have examples and suggestions of what you are expecting the students to learn. When reading the standards some of them are unclear and confusing.
363. Evolution is a scientific theory (which means it is a scientific fact, unlike the laymen term for "theory"). It should be taught the same as Cell Theory or Germ Theory (other scientific theories, i.e., facts)
364. A draft that does not include references to evolution should not be considered.
365. We should only be covering evolution in school. Creationism should be kept separate from schools.
366. Eliminating evolution from the state standards does not serve Arizona's students nor does it prepare them for life after high school.  
Please DO NOT adopt this draft (at least not for middle school). First of all, it puts the focus on scale, proportion, and quantity in sixth grade. Sixth graders have had little exposure to scale and proportion in math. Second, it applies most of this to atoms and space, which are extremely abstract concepts for sixth graders to understand. Third, the core content is just not there. Students will not be exposed to foundational science concerning plants, animals, rock, minerals, energy generation, heat
367. transfer...that has all been pulled out of the middle school curriculum. Fourth, the standards are poorly explained leaving room for too much interpretation or not enough. For example, in sixth grade it states that the focus is on energy and matter; yet, when you look at the standards, there is only one real standard that actually specifically mentions major energy types (all while limiting it to humans and technology). I have no idea how to interpret this and I have been teaching science for about 20 years. Last, it has added a lot of human impact concepts that are to some are unacceptable. Four main concerns need to be addressed prior to the AZ SBE adopting these standards:  
1) Theory of evolution/Big Bang Theory needs to be included in the standards. Biological evolution is descent with modification. Evolution helps us to understand the history of life. Including "belief statements" is not appropriate and has been in the courts previously.  
2)The standards as written are 2-dimensional; yet the introduction states that the standards are 3-dimensional. The crosscutting concepts need to be intertwined with the other two dimensions: content and practices.  
3) The earth and space science standards have many statements that are vague and terminology used incorrectly.  
4) The Science and Engineering Practices are not known as "scientific method". The linear steps in the Scientific Method is an approach that scientist/researchers use to publish their work - it is NOT how they do their work.  
I implore the ADE to step back from politics and revise the standards to improve student understanding of SCIENCE. I am an active Catholic, a former teacher, and a current instructor in a teacher preparation program. I am more than capable of separating my religious beliefs from what and how I teach. The same should be said for the ADE. Using terms like Theory of Intelligent Design, does not change what you are teaching Arizona's students. This is embarrassing for Arizona education. Again.
368. The removal or obfuscation of widely accepted scientific information and theories (e.g. Evolution and Climate Change) is highly disturbing and counter to the fundamental purpose of primary and secondary education - to prepare youth to be active, knowledgable, and productive members of society after they leave school. Censoring valid, peer-reviewed science because of theocratic dogma (especially when not all faiths embrace the same dogma) is only going to accelerate the decline of the United States from being a worldwide leader in innovation and scientific research to becoming eclipsed by most other nations in these areas. Science begets innovation, Innovation begets new jobs, New jobs begets economic prosperity for the future.
369. Let's go back to the science standards that have been generated by the National Academy of Science as well as the standards adopted by several states. We need the inclusion of science teachers in the creation of the science standards, with potentially some editing for grammar. Though as a 40 year science educator, nearly all scientist I know are good writers.
370. The State Board of Education should revoke Superintendent Douglas' ability to insert her own religious and political ideology into our science standards. If the Board approves these standards with
- 371.
- 372.



- the changes made by the Superintendent, they will be approving the politicization of our public school curriculum.
373. It is with great distress I have learned about the proposal by Mrs. Douglas to remove evolution from schools curriculum. While the developed world relies heavily on science and scientific discoveries our very own legislators try to set the great state of Arizona centuries back. Mrs. Douglas and her supporters must realize that the modern medical sciences are based on evolutionary foundations. Not to mention the fact that the ideas of evolution found applications in computers, AI, and various other disciplines. This is just plain embarrassing.
374. I would need reassurances that this draft was created with professional science educators who stick to SCIENCE. Not someone's religious beliefs. If evolution terms are changed to "theory", then "intelligent design" should also be listed as a "theory". Those wishing to change intelligent design to fact should save it for private/parochial schools.
375. Creationism or Intelligent Design should NOT be included in the standards. EVOLUTION should be included and not removed. Evolution is grounded by scientific fact, intelligent design is not.
376. It is illegal and an over-reach to insinuate any religious discussion into that of science.
377. This is unacceptable.
378. DO not allow "junk science" into our classrooms. I can not say it plainer than that. "Opinion" is not "theory", its just an opinion and no, it doesn't carry the same weight, so let's just nip this mental 'cancer' in the bud now!
379. I am NOT happy about the b\*\*\*\*\*t going on about de-emphasizing evolution. Don't make Arizona (any more of) a religious fruitcake state. Do not cheat our children out of a quality science education based on FACTS and EVIDENCE not bible bullshit.
380. No. Not in it's present form.
381. Creationism is NOT a scientific term.
382. No, they should not adopt this clearly religious bias form of standards. Removing scientific facts, and well established facts for decades, is a huge mistake on the AZ board of education. If they go down this path. it will cost the state a lot of money in legal fees fighting secular organizations that will surely sue based on Constitutional Violations.
383. See answer to #15
384. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
385. This DRAFT should not be adopted because it leaves out Evolution and includes Creationism.
386. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.
387. Do not disadvantage Arizona students in the name of religious politics.
387. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
388. Understanding the theory of evolution is critical to the fields of medicine, biology, and more. Please don't disadvantage Arizona students in the name of religious politics.
389. Not adopt
390. I am concerned about the movement away from the fundamental facts of science such as evolution toward the teaching of intelligent design (aka creationism). Not only am I concerned about this adversely affecting my 9 year old niece and public school student but I am offended by the sheer disregard for those who do not subscribe to these beliefs. If you wish to add intelligent design to the teaching then you must also include the alternatives to this such as scientifically proven evolution. Using the education science standards to push forward religious belief is reprehensible. I am also certain that this type of action will be legally challenged and unable to be implemented, and will be a waste of tax payer dollars in addition to a waste of student, teacher, administrator time. Let's let science remain science (unless we now have scientific proof of intelligent design).
391. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
392. No. Intelligent design is a nod to Christian dominionism and cannot be considered scientific in any sense of the word. The state governmebnt and Board of Education must maintain the strict separation between church and state in the schools. Science is science, not a religious agenda.
393. Evolution must be included as a fundamental scientific basic on which other fundamental bioical principles lie.

394. Do not adopt this draft unless you want Arizona education to become even worse than it already is.
- I am appalled that our state Department of Education, in the year 2018, is even considering crossing out "evolution" and permitting the teaching of "intelligent design" (creationism) instead. Arizona will not be able to compete on the global stage if we are teaching our children religious doctrine in lieu of actual science.
- 395.
- Religious beliefs including creationism have NO place in Public Schools. I am completely opposed to this standard and will oppose it every step of the way! Please do not include these religious beliefs as a standard for anything in public education. they are NOT scientifically proven elements and have no place in our public education.
- 396.
397. The AZ SBE should continue to refine the standards before adopting them.
398. Get some real scientists to write the science standards.
399. It should not adopt the draft as the science standards until it only represents true science.
400. No way should "intelligent design" be taught in public schools. I support science only ... not fairy tales!
401. Understanding the theory of evolution is critical to the fields of medicine, biology, and more. The advancement of intelligent design has no place in the public school system as it is a religious belief system. It has been deemed unconstitutional as part of the constitution's role in separation of church and state.
402. Evolution is understood in great detail. It is key to just about anything in modern biology and medicine. The motivation for intelligent design is almost exclusively religious. As science, it is crank science. Let's not make Arizona a laughing stock. The last thing we need is another Scopes trial.
403. This draft should NOT be adopted!
404. It is imperative that this Standards Draft NOT BE ADOPTED. It removes all references to evolution, which is WRONG. Understanding the theory of evolution is critical to the fields of medicine, biology, and more. Please do not disadvantage Arizona students in the name of religious politics.
405. Please do not accept the idiotic notion of intelligent design as any form of science. It is re-branded creationism that belongs in churches and not public schools. You will be doing our students, and the World, a great disservice if you do.
406. Do not adopt this until it matches what the committee originally drafted which included proper treatment of the theory of evolution!
407. No.
408. Separation of church and state
409. Evolution is established science that pervades all of modern biology and medicine. Intelligent design claims to be science, but the motivation is largely religious. If we make Arizona in 2018 like Tennessee in 1925, we will look like fools. And too bad for biotech!
410. Pleas do not take us back to the Dark Ages.
411. Yes, but I would also go further and articulate the discussion of intelligent design, how we get order out of an orderly and intelligent creator, and cannot get order out of chaos or complexity out of simplicity.
412. Please see my comments under 15 above.
413. Understanding the theory of evolution is critical to the fields of medicine, biology, and socializing, and other nature sciences These standards disadvantage Arizona students in the name of religious politics and continues degrade the state's reputation.
414. Evolution is the basis of biology, environment and even medicine. Our knowledge and understanding of evolution must be included in the Science Standards.
415. No, it want's to put a religion (not even one agreed upon by the masses) in place of science. Way to further alienate use from the educated parts of the world.
416. Keep science as a class based on evidence. Evolution is evidence based.
417. Send the standards back for review.
418. Please do not give teachers the option to choose between evolution and creationism - one is science, and one is religious ideology.
419. No. This draft is misleading on the scientific fact of evolution.

420. No. Remove Intelligent Design.
421. Definitely not!! Science needs to focus on facts not religious thinking.
422. If it omits Evolution, and instead includes the sophistry and lies of "Intelligent Design", it doesn't qualify as "Science" by any stretch of the imagination!
423. Draft is to be questioned.  
There is an obvious attempt in rewriting these standards to remove the word "evolution" where it pertains biology to introduce "other theories," such as intelligent design -- which fails utterly as a hypothesis, let alone a theory in the scientific sense -- into the science curriculum.
424. Please consult with legal counsel before proceeding further. See specifically Edwards v. Aguillard, Epps v. Arkansas, and, most recently, Dover v. Delaware. Pay particular attention to Judge Jones' "breathhtakingly inane" comment toward the defendants.
425. Evolution is the established standard of science. Imposing any other religious approach clearly shows a level of ignorance that undermines science education. And will make Arizona a laughing stock.
426. Religious leaning of ANY standards SHOULD NOT be included!!  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
427. Separation of church and state requires that this DRAFT NOT be adopted.  
The theory of evolution is critical to the fields of medicine, biology, and more.
428. Please do not disadvantage Arizona students in the name of religious politics.
429. 'Creationism' is not a science - It is a religious explanation of a religious belief.  
Absolutely NOT - until the words "evolution" and "evolve" are reinstated, this is merely a religious document with no scientific credibility. Apparently Ms. Douglas is quite ignorant of the scientific process and should not hold any office related to science education.
430. I do not support the inclusion of intelligent design or creationism in public school standards.  
Please do not teach creationism / intelligent design as science, as reported here:
431. <https://www.12news.com/article/news/arizona-could-roll-back-teaching-of-evolution-in-classroom/75-555209992>
432. We do not live in a theocracy, nor should the public be funding this kind of nonsense.
433. Absolutely not until the information about evolution is replaced and "intelligent design" teaching is removed. Intelligent design is a religious belief and should not be taught in public schools.
434. Science and religion are incompatible. Stick to science.  
Removing the teaching of FACT BASED evolution with the option to teach NON-FACT based religious based creationism in public SCIENCE classes is blatantly unconstitutional and will put Arizona students at a significant disadvantage. If religious parents want to put their children at a huge disadvantage by not teaching them the facts of science and biology let them send their kids to a private faith based school. Don't deprive an entire generation of kids from receiving a sound education.
435. See above
436. To say that evolution is "just a theory" demonstrates a gross misunderstanding of science. Biological evolution is not "just a theory", it is the most robustly demonstrated theory in all of science. By omitting this fundamental concept and achievement of the scientific method severely disadvantages the children of Arizona. They will not be able to compete with the jobs of tomorrow. Job in bio-science and medicine make money and cure diseases because they are founded on reality: the reality of evolution.  
Do not let ideology or ignorance hold our future back. Put evolution back into the curriculum. Facts aren't ideology. Evolution is a fact. You test it every time you get a flu vaccine or eat food from plant and animals humans have changed and domesticated over the last 10,000+ years.

- Shame on Diane Douglas. Keep your religion out of our schools.
439. As they stand right now with Diane Douglas' revisions removing evolution and the Big Bang, I am completely opposed to my tax dollars being used to promulgate this garbage. Companies are not going to want to come here and employ our graduates if they know they haven't learned scientific basics.
440. Do not adopt these weak and non rigorous standards.
441. The necessity of teaching EVOLUTION as part of the science curriculum is self evident. The story of INTELLIGENT DESIGN is better taught according to one's faith and in Church. It should certainly not be equated with true science but held quite separate and as private as one's faith.
442. This draft fails to acknowledge the theory of evolution, which is either a cowardly attempt to appease the religious right, or a sideways attempt to undermine science. My child will be entering the public school system in 3 years, and I expect she will learn SCIENCE, Not religious ideology posing as science
443. If and only if the terms "evolution" and "evolve" are restored and the term "intelligent design" is eliminated.
444. NO - go back to what the EDUCATORS wrote.
445. Evolution is an important part of science and should not be "crossed out" due to religious and political pressure. It is not helpful to try and balance with intelligent design, that doesn't stand up to the rigor of empiricism.
446. Understanding the theory of evolution is critical to the fields of medicine, biology, and more. I do not support giving educators the right to teach (their) religious views in public schools
447. It should not.
448. Board should not adopt this draft.
449. Board should NOT adopt this draft which does a disservice to students who need to know scientific facts as supported by verifiable research. "Intelligent design" has no place in science classes. It is a religious theory, not a scientific one.
450. Should not
451. The work of scientists and science educators should not be subverted by Christian zealots. We are not a theocracy. Evolution is not a theory. Stop watering down science to support your religious views. Religion belongs in churches and private religious institutions, not in public education.
452. Narrow minded and NON inclusive of GLOBAL vocabulary that is taught concerning biology. AND since when do try to MIX any form of religion in a science class. SEPARATION of church and state in CONSTITUTION late 1700's. Maybe we need to review our US History classes first!!!!
453. No. Evolution should be back in the standards.
454. Put in all forms of creation.
455. Draft does not represent student Science learning needs. Draft must represent factual needs of science that are supported by massive evidence.
456. Any changes made by Diane Douglas are inappropriate and an overreach.
457. We will never be able to compete in the world market if you perpetuate ignorant ideas as facts.
458. The process by which these changes were made is unacceptable.
459. NO.....
460. See above
461. Teaching evolution is an absolute necessity, especially for students planning to study university level biology, science or a medical field. I studied and have taught courses on Charles Darwin and have published a book-length study about how George Eliot and other novelists responded to evolution. It is a travesty to turn the clock back and pretend that evolution is not scientifically verified!
462. Teach evolution destroy religious ignorance.
463. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.  
Please do not disadvantage Arizona students in the name of religious politics.

464. Please maintain the integrity of our academic institutions and ensure that science curriculum is limited to science. This includes our knowledge of evolution, and must not include any notions of religion or creationism.
- This draft was not great before Diane Douglas added her uninformed, political edits. Now that Diane Douglas has removed evolution, climate change, and The Big Bang Theory, these are no longer science standards. These are now a political ideas about science through the lens of one type of
465. conservative Christian beliefs. Our science standards MUST reflect the scientific process and research as it is, not twisted into a politician's perspective. Ms. Douglas is not the head scientist in Arizona; she must remove her edits and allow the team of scientists and educators to write and edit the standards themselves.
466. It should not be adopted with Diane Douglas's religious based edits.
467. Please add evolution back into the standards.
468. Adoption of this draft would place our students at a strong disadvantage in the scientific community and the world.
469. Evolution is science. Period.
470. These standards should not be adopted in its current form. The theory of evolution should be included and should not be minimized.
471. No. The introduction of intelligent design (creationism) is unconstitutional advancement of religion in public schools as ruled in Federal court.
- A study published in Evolution: Education and Outreach which has been cited several times across the
472. US (<https://link.springer.com/article/10.1186/s12052-017-0066-2>) gave Arizona a grade of F for its middle school evolution standards. This draft does not improve the state's score.
473. Looks like an insertion of a particular anti-science view into a science curriculum.
474. Evolution happens from natural selection - period. Evolution is a driving force in the study of biology and should not be ignored. Science is a process that needs to be nurtured in lower grades and strongly used in high school
475. keep your fairy tale in it's own book and out of our schools!
476. No, obvious interference due to one's religious beliefs should NOT be part of the standards. Arizona will look foolish and our students should not be subject to this interference.
477. Our education is already one of the lowest in the country. Removing evolution is just making it worse.
478. The AZ public school system is in a sad state. This nonsense just drops us to an even lower level.
479. Continue to teach evolution. Do not remove it to teach creationism.
480. See above
- The decision to take out any references to evolution is misguided and troubling. Evolution is one of the most supported scientific facts. It confirmed by multiple lines of evidence from genetics to geology. If you want to understand the natural world you have to understand evolution. It is what makes sense of the natural world. To leave it out of public education would be doing a disservice to our students, and would require our teachers to be intellectually dishonest. This draft of Arizona's science standards should not be approved.
- 481.
- I strongly disagree with the removal of evolution from science teaching to our youth. This will give
482. Arizona children yet another disadvantage as compared to their peers in other states. Its appalling that this is even a consideration.
483. Absolutely not. The new "standards" are not science.
484. Please do not remove to concept of evolution from state teaching standards.
485. Trying to rewrite science to fit a religious belief system is foolish and illustrates ignorance on many levels not to mention the disrespect shown to the science teachers and the science community who wrote the original draft. There is no place for politics in science standards.
- I think that there is revision to be done. I prefer bullets and more of the NGSS written approach.
486. They provide the math, ELA, etc. standards. I rather have something like that they what the new standards have. The new standards are hard to read and follow. The flow is limited.
487. The DRAFT Standards MUST be revised to include direct mention of evolution and scientifically rigorous discussion of evolution. The future scientific literacy, and hence future economic



- competitiveness and informed decision-making, of Arizona students has been put at risk by cynical fundamentalist politics. You must remedy this immediately!
488. AZ State Board of Education should definitely NOT adopt this draft
489. See comments about evolution
490. NO! Belief nowhere belongs in the scientific method. Develop hypotheses and then them--those belong in science. Keep alternate beliefs in some other domain.
491. I truly believe that Arizona has not spent enough time investigating what great standards should look like. I feel that Arizona has only rearranged what was previously written with an emphasis on engineering. More research needs to be completed before standards should be adopted.
492. NO! The scientific method has no allowance or belief in what one wants to be true to pass as evidence. Religious or other belief systems do not belong in a science course. Keep them where they do belong: a place of worship or in prayers.
493. I would like to know who changed the standards during the internal review? there has never been an internal review why now. It does not seem transparent.
494. Do not adopt this draft until factual information about evolution is included.
495. No you can not adopt standards that are not teaching real science
496. As a science teacher, I strongly support the premise that evolution is a major unifying concept in science and should be included in the K-12 education frameworks and curricula/standards. This position is consistent with that of the National Academies, the American Association for the Advancement of Science, and many other scientific and educational organizations. Although some would argue the teaching of evolution should not occur because it is a "theory", they are not familiar with science terminology. In the discussion of what valid science is, you should define the word theory as it is used in the scientific community. In particular, you should note that a theory is a well-substantiated explanation that incorporates facts, laws, inferences, and tested hypotheses, and that theories can be tested, modified, and rejected. Theories are valuable because of their explanatory power and their usefulness in making and testing predictions. The alternative "theories" that typically serve as the springboard for student and parental questions tend not to be scientific theories because they cannot be tested, they lack explanatory power, and they do not provide the basis for additional research. That is why these alternative "theories" should remain omitted from any science curriculum, not because of censorship or unfairness. However, in contrast, the Theory of Evolution has, been tested and supported with data driven evidence and so should not be removed from science classrooms where it is a critical scientific cornerstone.
497. The decision to remove the topic of evolution from standard curriculum is an extremely irresponsible and dangerous decision which will impact many future careers, giving the children of Arizona a lesser chance at succeeding in a variety of biological, chemistry based, scientific or geological careers. Children in Arizona desperately need a level playing field with the rest of the nation; which means a more comprehensive standard, not a lesser one.
498. Use your heads; religion is not science, it's mythology. Evolution is tried and true science. Try reading about it.
499. I would encourage the state board to reject the draft science standards as written. The standards seem to grant priority to the desires of a particular group over another, thus elevating a specific agenda that runs counter to the very scientific principles purported to be advanced by the standards. Put simply, the current set of standards lacks the clarity and objectivity required to properly serve students in the public setting.
500. I've really not liked the composition of the current board.
501. Do NOT strike out references to evolution and evolve, we absolutely need all students to understand the theory of evolution - it is critical to understanding many more fields of study. Leave the teaching of religious beliefs to the parents at home and churches. Thank you!
502. I feel that a lot of revisions still need to happen. Taking out EVOLUTION wording SHOULD not be stricken and modified with new vocab. Evolution is Science thinking. Do not spiral space and earth science KEEP it in 7th.
503. Science is science. Religion needs to be left for the churches to teach. It does not belong in the science classroom. There is supposed to be a separation of church and state.
504. There are a number of things to be fixed before these can be used across the state. AZ must remain competitive. These are a good start, but more work is needed.
505. I reviewed the marked up version of the standards that highlighted the recent edits. Below I refer to the "original language" as the language that has been struck or modified in the edited version. I

believe the standards need to be revised to make at least the following changes.

General comments about the standards:

1. The use of the word "theory", preceding the word evolution is not needed. Evolution is not a theory.

2. All locations wherein the word "evolution" has been replaced by phrases like "traits change over time" should be replaced by evolution. I am not sure why this language has been changed. Evolution is only a "theory" in some communities that do not study biology. The standards should reflect the currently adopted scientific consensus.

3. The authors make grammatical mistakes and often misuse the word "which" when they should be using the word "that."

Specific standards comments

2.E2U1.8: Analyze and interpret data to explain the Earth's position in relation to the Sun at different times during a twenty-four-hour period and changes in the apparent shape of the Moon from one night to another.

Comment: Original language was correct. The Earth's position relative to the sun does not change significantly during a 24-hour period and the data to show the position change would not be accessible to a second grader. The standard should revert to the original language that discusses the Sun's position as observed by an Earth-fixed reference frame at different times during a 24-hour period, or the standard should use the word "orientation" rather than "position."

4.L4U4.12: Engage in argument from evidence to support a claim about the factors that cause species to go extinct and how humans can impact those factors.

Comment: The original language that used the wording "Use" rather than "Engage in argument" was a more appropriate scientific standard. The ability to debate should be housed within a different set of standards. Science standards should be about collecting information and drawing conclusions based on empirical evidence.

506. No, if you don't treat evolution as fact that this draft should not be supported. There is no dispute that evolution is a fact.

Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.

507. The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.

The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.

The changes outlined above weaken the Arizona K-12 science standards and move us away from creating a system that provided world-class education. I oppose these changes.

Arizona needs to realize that by removing all references to evolution from your state standards that you're doing your children a huge disservice. Even if this is something that many of your politicians disagree with, the majority of the world DOES agree that evolution is real and is documented.

508. When your students interact with the rest of the world, you need for them to be as prepared as possible. With the standards written as they are now in this draft, the children of Arizona will be insufficiently prepared for their adult lives.

To quote Neil deGrasse Tyson, "The good thing about science is that it's true whether or not you believe in it."

509. Please reject this draft for the reasons I stated above.

510. see above comments. thank you.

511. Absolutely not!
512. Not enough new material. Evolutionary standards appear to be moving backwards.  
Removing evolution is absolutely ridiculous. Don't embarrass our state's Science departments by
513. removing facts from our curriculum. This draft should not be adopted without representing the most up to date Scientific knowledge. You can't deprive our students from success.
514. The High School Life Sciences portion should be re-written to capture the central place of evolution in modern Biology.
515. The current draft should be rejected until there is a specific mention of the scientific concept of evolution to avoid teaching children the false religious believes on this scientific subject
516. I do NOT think Arizona's Board of Education should adopt this DRAFT as Arizona's Science Standards!
517. They should not. The biology standards are weak and do not represent the state of the science.  
The draft is acceptable if revised to include the views of scientists who differ from the commonly
518. taught explanations of origins and development of life and the cosmos. Students should be presented with all sides of a controversial topic, not just one.
519. I repeat, it's another illegal attempt by the religious right to suppress the teaching of evolution in our schools.  
As stated above we should not be teaching particular religious beliefs in our should science programs.
520. It would be fine to have a religious studies elective course but science is not where that material belongs.  
Children should NOT be corrupted by your sorry use of terminology regarding evolution. You are
521. pandering to creationism and is not acceptable by any scientific or constitutional standard. Children should be taught HOW to think, not WHAT to think. I teach my child to value TRUTH and you should do the same.
522. It should not, not, not. Children need computation literacy, a full understanding of the scientific method, ask questions and develop critical thinking  
EVOLUTION is NOT a theory. It is a fact, proved by scientists around the world many times over. Stop
523. trying to put your religious beliefs in our school system. Keep the wording regarding evolution, the big bang theory in our kids curriculum. Arizona schools are already behind the nation as it is. Do you want our kids to be laughed out of college science programs??  
Removing the requirement to teach evolution represents a further encroachment against the
524. separation of Church and State. This is a slippery slope. Had this been proposed when I relocated my young family here, I would never have moved into this state. Hiding science from our students due to religious beliefs is just wrong.
525. No, the State Board of Education should not adopt this draft. With regard to the de-emphasis of evolution in this draft, scientific facts must be taught and labeled as such.  
The Board of Education should not adopt this DRAFT. Evolution must be added back into the
526. document. Evolution is supported by science, and this document runs the risk of putting students and teachers at a disadvantage by using ambiguous and tentative language about evolution.
527. Evolution should be taught if future generations want to be competitive with the rest of the world.
528. Revisions are necessary
529. See section 16.
530. No - the "rigor" of the content is compromised by the authors' attempts to skirt around topics such as evolution and the big bang theory.  
Any future public or internal review, should allow the larger Standards Committee to be re-engaged
531. to ratify any changes and allow transparency regarding rationale, and ensure: interconnectedness of the content, practices, and concepts; and vertical alignment of the standards across grade levels and around core ideas.  
Schools should teach science, reason, logic and critical thinking. Evolution is bedrock science based
532. on verifiable evidence. Creationism and intelligent? design are based on mythology and have no supporting evidence. Diluting evolution in science is being proposed to support superstitious individuals supernatural beliefs.
533. Evolution and the Big Bang theory should not be edited from the original recommendation of the science experts.
534. The Department of Education's changes to the draft science standards disappointingly appear to weaken the standards' emphasis on evolution as the bedrock of biological science. The theory of

- evolution is as central to modern biology as the germ theory is to modern medicine. Arizona public school science classes should help the state's youth overcome ignorant anti-science beliefs, not cater to them.
535. Increase the focus on evolution and information about observed and anticipated climatic changes in the earth system.
536. Evolution, not intelligent design, is based in science. Science should be taught in science classes.
537. No the board should not adopt these standards.
538. NO NO NO NO NO NO NO NO NO
539. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
540. NO definitely not, it will put AZ children even further behind the rest of the country.
541. Science is more than vocabulary words. It's about questioning, curiosity and experimentation. These standards seem to keep the focus on memorizing a bunch of vocabulary words.
542. As proposed, it is fair and balanced.
543. The Arizona State Board of Exuctiao. Should NOT adopt this draft of the science standards without the theory of evolution.
544. Please see #15 above. Thank you.
545. Your responses (in parentheses) assume things that are not necessarily meant if one agrees or disagrees with the statement. The Dept of Education has over-stepped it's role by assuming that they know better than the hundred educators and community members who wrote the original draft. The new draft must go back to the original committee for their revisions of the revisions.
546. There is no Biology without an understanding of Evolution
547. Religion should have no role in the development of scientific standards as the two are entirely separate entities. I write this curt opinion as a holder of two degrees, one in biochemistry and the other in molecular/cellular biology, and as a Catholic. Your nonsense will put our children at averse risk.
548. Omitting the scientific facts you don't agree with does nothing to make those fact any less relevant. Teach science! They can learn religion on Sunday morning..
549. Put evolution back and leave creationism out
550. I am appalled at the treatment of evolution in your science standards. Please keep your religion out of what is being taught in public classrooms.
551. We have accepted evolution.  
read a book! Move on!
552. I am a Christian, but I disagree with the changes made to the teaching of evolution. It is important to avoid letting religious ideology overwhelm the teaching of core concepts.
553. This draft is not an improvement over the 2004 science standard.
554. Evolution is real.
555. These new standards have clearly been revised to devalue the internationally accepted Theory of Evolution and encourage the religious concepts of creationism, against overwhelming scientific evidence. Evolution is not incompatible with religion; it is accepted by most major religions in the world. This type of pandering to extremist minorities are an embarrassment to our great State. This thinly veiled attempt to undermine science cannot be tolerated by an intelligent, upwardly mobile society, that Arizona should strive to be.
556. As above.
557. We need to be bold enough to move ahead with NGSS.
558. This draft is inadequate.
559. I do not agree with any draft that removes teaching about evolution. Evolution is a scientific fact and needs to be taught to our students if we want our students to be competitive with others.
560. Put science back in the science curriculum ==NO intelligent design religious nonsense

561. It seems a bit light on essential terms such that a teacher could easily skim certain topics.  
Suggestion: Essential terms and Plus+ terms for rigor.
- Do NOT include: Intelligent Design (NO evidence!)
562. Removal of specific reference to evolution and/or any attempt to conflate religious creation stories with scientific theory is inappropriate. Evolution is the best available scientific theory in support of the origins of biological diversity. Failure to specifically educate about accepted scientific theory is a huge step backward in our educational process.
563. No, this needs to revert back to including Evolution.
564. See above! Arizona deserves science in the classroom, not political interference.
565. This draft should definitely NOT be adopted.
566. Our students must be informed about evolution. The political grandstanding is ridiculous- evolution is supported, documented scientific fact that students in other states and countries learn about on a daily basis. If evolutionary facts are ignored, our students will not be prepared to get into demanding universities or be ready for the world outside of the classroom.
567. No.
568. Standards should be left to be developed and maintained by science education professionals.
569. Removing the teaching of evolution from the curriculum is misguided.
570. Please just STOP changing things based on this ridiculous women's recommendations that are not justified nor are they needed.
571. They should not. It is not an improvement and it is not progress.
572. As a proud Arizonan, I reject this religious farce. Keep your religion out of my children's classes. I will take this as proselytizing using government funds and will join any lawsuit against this curriculum. If you want to learn about bunk science, go to your church.
573. For Diane Douglas who says that "evolution is just a theory", please read this excerpt from a document written by the National Academy of Sciences: "In science, a 'fact' typically refers to an observation, measurement, or other form of evidence that can be expected to occur the same way under similar circumstances. However, scientists also use the term 'fact' to refer to a scientific explanation that has been tested and confirmed so many times that there is no longer a compelling reason to keep testing it or looking for additional examples. In that respect, the past and continuing occurrence of evolution is a scientific fact. Because the evidence supporting it is so strong, scientists no longer question whether biological evolution has occurred and is continuing to occur. Instead, they investigate the mechanisms of evolution, how rapidly evolution can take place, and related questions."  
From Science, Evolution, and Creationism, National Academy of Sciences and Institute of Medicine. © 2008 National Academy of Sciences  
Obviously, Ms. Douglas has no educational expertise in the area of science. She has admitted that she does not believe in evolution. Her personal beliefs should not be allowed to prevent Arizona students from receiving a science education that will allow them to be competitive with students from more enlightened states.
574. Intelligent design is a religious propaganda not science. Remove it from this standard
575. No! Do not adopt this draft. It is not reflecting new scientific standards. It is focusing on economic benefits of science and not the inquiry that lays the groundwork for science. It eliminates core scientific principles, such as evolution. It does not discuss important issues in science today, such as sustainability. How will our children learn to preserve and conserve water if it is only viewed as an economic resource to make products?
576. No form of creationism should be taught in public schools period. It is unconstitutional & will waste more tax payer \$ when it inevitably ends up going to court & gets shot down. Please revise.
577. Please don't waste the school funds in frivolous lawsuits. You cannot put religion into public schools.
578. Absolutely not, please do not devalue my college degree from Arizona by adopting anti science crap as the standard for education. I need employers to respect my degree not to think it is worth less than the paper it is written on
579. They should not be adopted. Evolution should be included.
580. Do not remove the science of evolution from the standards.



581. Absolutely not
582. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
583. Teaching creationism in school is an unconstitutional endorsement of religion in tax payer funded public schools. Any effort to introduce this into school curriculum will be met with strong opposition.
584. Evolution is a fact. It is not a theory. Please help our students succeed by ensuring that evolution is taught as a fact, and not as a theory. Take the religion out of the science classroom.
585. These standards should not be adopted without being revised to include the controversial arguments that do not support Darwinian evolution.
586. Whatever changes are trying to be made with the state leadership should NOT be adopted, only what the experienced science educators think is best. If they feel that including evolution in the standards is appropriate, then I trust them as the professional science teachers that they are.
587. Adding and maintaining teaching Evolution needs to be continued.
588. These standards absolutely should not be adopted until evolution--a fundamental concept in biology-- is incorporated into the draft.
589. It should not be adapted until biological evolution is added back to the curriculum.
590. Evolution a geology need to be taught as they are understood by modern science, and not as a fundamentalists Christian believes they should be taught.
591. I do not support this draft since it has taken the scientifically proven topic of evolution out of the standards.
592. How are ideological changes appropriate in state standards? How are these standards creating students who will be knowledgable, and therefore competitive on a global stage? Shameful! Evolution is the best theory scientists have. It is widely accepted in the secular standards and science community. Should we stop teaching plate tectonics, genetics and earth layers because they are theoretical and not law? Throughout history religious believers have been able to separate the discipline of science and their own belief structure. Why is Arizona willing to move backwards? Inequity in education! Shameful!
593. References to Evolution should be left in.
594. Absolutely not, not until you've put evolution and actual \*science\* back into it!
595. Evolution is a fact based scientific core idea. The science standards must not be written to leave a question as to the intent of a standard. Using the phrase "theory of evolution" implies that evolution is an unproven idea, which is not true.
596. I am not in favor of putting physics in 7th grade and energy in 8th grade
597. Arizona State Board of Education should NOT adopt the changes outlined in the draft.
598. Science should only teach scientific theories based on science. We need to leave religion to the home and church. It has NO PLACE in our publicly funded schools!
599. I appreciate the changes that have been made in regards to the wording of evolution. We need to keep this theory in the scientific realm and the new wording does exactly that.
600. Not in its current form - for reasons stated above.
601. No, they should not.
602. Keep religion out of schools.
603. Science is for education in the schools---religion is for church.
604. Reject the stadards and get the religion out of science classes.
605. I believe creationism should be taught as well.
606. Evolution is necessary. You can't take s ience out of science curriculum.
607. This is a start. This is nowhere ready to use on a teacher level. Too complex, unnecessarily. I do not believe that you had anyone who was versed in 3D learning working on this. Some of us have taught 3D in our classrooms and it does not look or feel like this. 3D is best in units, takes more time, and MUST be organized.
608. The changing of how evolution and the Big Bang represented in the standards is a disservice to intellectual rigor of Arizonans. Without using the proper diction, this opens to door to validating

- teaching of outdated hypotheses, factually fragmented ideas, or mistruths. This is embarrassing.
608. NO. NOT UNTIL THEORY OF EVOLUTION IS TAUGHT IN AZ SCHOOLS. SCIENCE STANDARDS SHOULD BE FROM EXPERTS IN STEM FIELDS, NOT POLITICIANS.
609. Should not until evolution is reinstated as the only valid \*scientific\* theory
610. I think the wording around the evolution topic should be strengthened to support evolution, rather than weakening the wording to leave some wiggle room open for interpretations to allow other doctrines to make it into our science classes.
611. This draft needs to include the specific language about the Big Bang Theory (origin of the universe) and evolution.
612. This draft should not be adopted. Modern life sciences are rooted in the concept of evolution. By ignoring evolution, you are giving our students a second-class education instead of preparing them to contribute to society as teachers, researchers, and medical practitioners.
613. Not worthy of our students.
614. Don't allow religious belief and ideology to impact scientific fact. By doing so you will contaminate the educational experience of Arizona's children. Comparative religion is a valid part of education but not a part of science.
615. One word--Evolution. It is science!
616. Need to remove the edits regarding evolution. Evolution and change needs to be in the standards.
617. AZ needs to keep evolution and concept of evolving in our textbooks. Do not dumb this down. That is going backwards.
618. Please go back, and take the moment to understand the science of evolution, and remove the changes that were made to the evolution standards.
618. For a state that is attempting to bring high tech industry to the state, going BACKWARDS on science in our school system is simply NOT the way forward in competing for those high tech companies to bring jobs here!!
619. Do not adopt this draft!
620. See comment #9
621. Wording about evolution should not be changed from the previous version. The current draft leaves room for teachers to misrepresent the consensus in the field, which may leave promising science students embarrassingly underprepared for university.
622. No, No, No, and No.  
You are making Arizona an embarrassment.  
If people want to study about Intelligent Design (ie, modern Creationism), then they can do it at Church or at home, but NOT in a public SCIENCE classroom.
623. The AZ State Board of Education should reject any attempt to confuse, weaken or distort the universally accepted and fact based evidence of science.
624. See first comment
625. De-emphasis of evolution does not advance science education. There is no scientific controversy about evolution.
626. "Open Letter To Kansas School Board  
I am writing you with much concern after having read of your hearing to decide whether the alternative theory of Intelligent Design should be taught along with the theory of Evolution. I think we can all agree that it is important for students to hear multiple viewpoints so they can choose for themselves the theory that makes the most sense to them. I am concerned, however, that students will only hear one theory of Intelligent Design.
- Let us remember that there are multiple theories of Intelligent Design. I and many others around the world are of the strong belief that the universe was created by a Flying Spaghetti Monster. It was He who created all that we see and all that we feel. We feel strongly that the overwhelming scientific evidence pointing towards evolutionary processes is nothing but a coincidence, put in place by Him.
- It is for this reason that I'm writing you today, to formally request that this alternative theory be taught in your schools, along with the other two theories. In fact, I will go so far as to say, if you do not agree to do this, we will be forced to proceed with legal action. I'm sure you see where we are coming from. If the Intelligent Design theory is not based on faith, but instead another scientific theory, as is claimed, then you must also allow our theory to be taught, as it is also based on science,

not on faith.

Some find that hard to believe, so it may be helpful to tell you a little more about our beliefs. We have evidence that a Flying Spaghetti Monster created the universe. None of us, of course, were around to see it, but we have written accounts of it. We have several lengthy volumes explaining all details of His power. Also, you may be surprised to hear that there are over 10 million of us, and growing. We tend to be very secretive, as many people claim our beliefs are not substantiated by observable evidence.

What these people don't understand is that He built the world to make us think the earth is older than it really is. For example, a scientist may perform a carbon-dating process on an artifact. He finds that approximately 75% of the Carbon-14 has decayed by electron emission to Nitrogen-14, and infers that this artifact is approximately 10,000 years old, as the half-life of Carbon-14 appears to be 5,730 years. But what our scientist does not realize is that every time he makes a measurement, the Flying Spaghetti Monster is there changing the results with His Noodly Appendage. We have numerous texts that describe in detail how this can be possible and the reasons why He does this. He is of course invisible and can pass through normal matter with ease.

I'm sure you now realize how important it is that your students are taught this alternate theory. It is absolutely imperative that they realize that observable evidence is at the discretion of a Flying Spaghetti Monster. Furthermore, it is disrespectful to teach our beliefs without wearing His chosen outfit, which of course is full pirate regalia. I cannot stress the importance of this enough, and unfortunately cannot describe in detail why this must be done as I fear this letter is already becoming too long. The concise explanation is that He becomes angry if we don't.

You may be interested to know that global warming, earthquakes, hurricanes, and other natural disasters are a direct effect of the shrinking numbers of Pirates since the 1800s. For your interest, I have included a graph of the approximate number of pirates versus the average global temperature over the last 200 years. As you can see, there is a statistically significant inverse relationship between pirates and global temperature.

In conclusion, thank you for taking the time to hear our views and beliefs. I hope I was able to convey the importance of teaching this theory to your students. We will of course be able to train the teachers in this alternate theory. I am eagerly awaiting your response, and hope dearly that no legal action will need to be taken. I think we can all look forward to the time when these three theories are given equal time in our science classrooms across the country, and eventually the world; One third time for Intelligent Design, one third time for Flying Spaghetti Monsterism (Pastafarianism), and one third time for logical conjecture based on overwhelming observable evidence.

Sincerely Yours,

Bobby Henderson, concerned citizen.

P.S. I have included an artistic drawing of Him creating a mountain, trees, and a midget. Remember, we are all His creatures."

627. This draft is as egregious as it is spectacularly unconstitutional. Meant to undermine technology and science because science undermines the small minded and their view on the world.
628. The addition of Creation would complete the DRAFT.
629. I think the draft should be adopted if: the instances where "evolution" was replaced with "biological diversity" are reverted back to "evolution" (see comment in previous question); and the typo on page 29 is corrected - that's just poor editing...
630. This draft should not be adopted without major revision.
631. Regarding the board's decision to replace the term "evolution" in the curriculum with more general language, I appreciate the state's courage in approaching the science curriculum from an unbiased, objective, and open-minded perspective. All too often vocal activists take overt offense to those who think differently from them and those with truly inquisitive and nondiscriminatory perspectives back down under pressure. I hope that the Board of Education and Superintendent of Public Instruction remain steadfast in their resolve to provide a truly science based curriculum.

Science is not advanced with consensus. In fact, science is advanced by questioning consensus and

approaching problems from directions previously not tread. Galileo, Semmelweiss, Darwin, Wegener, and Einstein all had to battle against this religion of "Science by Consensus." Einstein shot down the idea concisely in response to Hundert Autoren Gegen Einstein (tr, Hundred Authors Against Einstein), a collection of criticisms of Einstein's theory of relativity by 100 authors, "Why 100 authors? If I were wrong, one of them would be enough!"

I implore the board to remain objective and not back down on moving forward with a curriculum that challenges consensus beliefs. I hope and pray that this will catapult Arizona into the premier states for STEM education.

632. They certainly should not. It would be an incredible step backward.
633. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.
634. This draft is an outrageous attempt to undermine the separation of church and state by under cutting the established scientific principle of evolution. Arizona students deserve the learning of scientific principal, not religious dogma.  
Second grade - the word "environment" should not be omitted - this looks to be avoiding one of the greatest issues impacting our world, i.e. climate change.
635. References to evolution should not be omitted or referred to as "theory." The word, "theory" should be used throughout the document or not at all. Scientific knowledge develops out of theory.  
  
The Science standards should reflect the separation of Church and State and should not be influenced by religious beliefs or political affiliation of any group.
636. As stated above.
637. The language that sidesteps evolution should be revised. Stating that the SEPs were formerly the scientific method should be edited. Asking 1st graders to plan and investigate rather than just investigate will make assessing those standards difficult. Those verbs matter and, while they reflect the language in NGSS, they must be grade appropriate and reasonable.
638. Do not approve of language/word changes...focus on what is currently widely held, accepted scientific information. When it becomes incorrect - scientifically proven, vetted - information, then maybe change/revise
639. Only ignorant people would support a draft sweeping millions of years of fossil evidence under the rug!!!!
640. Needs more work to prepare our children for the technology age. Not enough emphasis on the applied sciences.
641. The Science standards do not reflect science, they reflect personal views
642. I believe that corrections need to be made. The draft currently removes a well researched and scientific theory that is overwhelmingly accepted on a global level. The reason for this change is not properly explained and would lead an observer to question the intent. Science needs to be properly taught if Arizona is to succeed academically.
643. This should not be adopted.
644. I want children and adults in the public education system to know exactly how they are related to other life forms and the natural world. No religious affiliation has any right to take this knowledge away from any of us, ever.
645. Deletion of evolution is IGNORANT!
646. Science standards should encourage critical thinking and evaluation of the evidence relating to evolution.
647. As tax payer and parent I cannot support ASS that will halt proper education of our children, and deny them opportunity to compete on national and international level.
648. STOP
649. It will be shameful for the Arizona State Board of Education to adopt these standards.
650. THE ASE STANDARDS SHOULD NOT BE CHANGED BY THIS CURRENT PROPOSAL.
651. The word evolution should not be eliminated in the standards. Our science standards should be approved by the National Center for Science Education.
652. No. I disagree with the state eliminating requirements that students be able to evaluate how inherited

- traits in a population can lead to evolution.
653. For the reasons I stated in Question 15, I would ask that Arizona State Board of Education reconsider this Draft
654. I disagree with the state eliminating requirements that students be able to evaluate how inherited traits in a population can lead to evolution.
655. Science standards that downplay the current state of human knowledge in science have no place in Arizona's Schools. Our children deserve better.
656. Arizona's science standards should be based on scientific study. The inclusion of terms such as evolution and "big bang" are, therefore, an integral part of an education in science.
657. Evolution needs to be taught. Students also need to understand the effect humans have on the environment such as pollution and the decline of habitats.
658. Definitely not. The proposed changes to mentions of evolution are reprehensible and uninformed.
659. Don't adopt this draft.

I am writing as a current college science professor, with a Ph.D. in environmental science from U of A. I like the addition of more engineering design to the standards, and I appreciate the language that asks students to ask questions and cite evidence. It is so important for students to understand the importance of using evidence to support scientific claims.

In standard HS.L4U2.31, return the word "evolution" instead of "biological diversity." These are not the same thing, scientifically speaking.

In HS.E2U2.17, Big Bang should be included as one of the primary theories in the list. Perhaps "Analyze, interpret, and critique supporting evidence related to the scale and expansion of the universe, including the Big Bang theory."

660. The standard HS.E1U4.14 should explicitly discuss the impact of energy generation on climate systems. More specifically, students should understand how the burning of fossil fuels upsets the carbon cycle and leads to excess CO2 in the atmosphere, which in turn leads to global warming and climate change. This is an accepted science theory, from thousands of climate scientists from hundreds of countries around the world. When students enter my college class from the K-12 system they tell me, "We need to be learning about this earlier. Why didn't we learn this in grade school and high school?"
- The standard HS.E1U2.12 should explicitly include a reference to Milankovitch cycles, which explain changing climates on Earth over geologic time scales. These cycles explain much of the natural variation of past climates. Students should also learn how scientists collect evidence about past climates and what these studies show.
661. Only with edits to convey the rigorousness of study and the widespread scientific acceptance of evolution.
662. This text MUST be restored as written by the committee without unscientific changes made by administrators who don't understand evidence based science principles.
- This draft attempts to discredit the theory of evolution and as such does not represent the type of high quality education that the students of Arizona deserve. As a college level biology instructor I feel that evolution acts as the organizing principle for understanding biology. Removing or discrediting evolution in the classroom is a disservice to our student who need a solid foundation of biological education for a number of vital careers, including medicine and bioscience research.
663. Science Standards should be determined by science educators. There should be no teaching of
664. Intelligent Design or any other form of Creationism in public schools, or any schools for that matter, as they are not based in Science.
665. Include more rigor, higher level processing skills, and scientific language.
666. I urge the Dept. of Ed to change the current draft of the AZ Science Standards by restoring all original language referencing evolution proposed by the committee of educators with expertise in science education. I also urge the Dept. of Ed to refrain from inserting religious ideology and indoctrination into the education system such as removing references to evolution, referring to a "theory" of evolution, replacing the term evolution with other concepts such as "biological diversity" or other attempts to prevent young people from learning about evolution and science as currently understood by the scientific community. It is inappropriate for the Department of Education or any other governmental body to force a particular religious ideology into the standards process. For this reason, I request that the draft standards not be adopted as rewritten by the Department of Education but



- rather be adopted in the form originally proposed by the educators with expertise in science and science education in relation to evolution and related concepts.
667. I implore the AZ State Board of Education NOT to pass these Science Standards until the language regarding evolution is restored to its previous version. The other edits, such as adding language about carrying out investigations and modeling experiments, should be adopted.
668. Revert the latest edits that show evolution to be less successful than it actually is. In the context of Diane Douglas's on-the-record advocacy for teaching the non-science of intelligent design, these edits are not for honest development of the Standards but for advancing anti-science ideas.
669. As, I said that it should not be altered!
- We should be teaching children science, not belief, in the school system. Evolution has been confirmed by science and we do not need vague and confusing language added to Arizona's Science Standards.
670. It is clear that the text regarding evolution was changed due to a Diane Douglas' beliefs, not scientific evidence. The problem is that the United States is comprised of people believing in over 300 different religions or denominations. Who are we to say that the belief of one religion is correct and others are wrong. That is the role of the church, not the public education system.
- Teach science in schools. Let churches teach religion.
- Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
671. Please don't avoid education on evolution.
- I urge the Dept. of Ed to change the current draft of the AZ Science Standards by restoring all original language referencing evolution proposed by the committee of educators with expertise in science education. I also urge the Dept. of Ed to refrain from inserting religious ideology and indoctrination into the education system such as removing references to evolution, replacing the term evolution with other concepts such as "biological diversity" or other attempts to prevent young people from learning about evolution and science as currently understood by the scientific community. It is inappropriate for the Department of Education or any other governmental body to force a particular religious ideology into the standards process. For this reason, I request that the draft standards not be adopted as rewritten by the Department of Education but rather be adopted in the form originally proposed by the educators with expertise in science and science education in relation to evolution and related concepts.
672. I think you should get it by now . . . .
673. The standards have been modified beyond what science education experts suggested. Removing the references to evolution plays down a core concept in biological science. Biodiversity is not the same concept as evolution. The scientific method has not been removed, it has always been a part of the scientific and engineering practices.
674. The board needs to scrap all of creation teaching and revert back to science and the teaching of evolution.
675. This is a misrepresentation of the word "theory" and Diane Douglas is trying to manipulate education standards to indoctrinate children with religion. Intelligent design is not scientifically valid and should not be included in any way, shape, or form, in the scientific standards for Arizona's education. Evolution has been scientifically tested and supported with obscenely high amounts of evidence, all of which has been peer reviewed and verified for its rigor and scientific value. Diane Douglas is so outlandishly ignorant that she thinks she can actually supersede all of that because her and her bible-thumper friends think they can. This is the kind of behavior that actually lands you in Hell, Diane (assuming there is a Hell). If this garbage actually gets ratified/passes, then Diane Douglas should be referred to as the Theoretical Superintendent, since she just wants to misrepresent fact as conjecture.
676. They should fully adopt the new draft in its entirety.
677. Listen to the experts. These standards are not an improvement. What's next? Teaching the earth is flat?
678. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
679. They should not. Science curriculum should be decided by science educators not politicians. There is
- 680.

- no place for religion in schools.
681. I cannot support such idiotic move, to replace science with religious beliefs.
682. IF the state adopts this draft, it SHOULD WAIT UNTIL AT LEAST 2019-2020 school year. The summer is an inappropriate time to expect teachers and schools to prepare to teach standards which are not yet even out of draft phase.
683. Creationism should only be taught in Sunday School, not in a government funded program of any sort.
684. No.
685. Replace "evolution" every place it was removed!
- The relative merits and rigor of different approaches to discovering new knowledge are not adequately addressed. For instance, students will not come away with a strong, personal understanding of how and why observational data has different merits and limitations than experimental data. This is critical to EVERY domain of knowledge, yet is severely lacking in these standards. Also, established knowledge is referred to in the standards, misleadingly, as theories. Not only that, but also the difference between colloquial meaning and scientific meaning of the terms fact and theory are not addressed, and no personal understanding and experience of the differences between those are required for students.
- 686.
- The future of our economy and nation will rest on our children having the rigor to design quality experiments, have experience conducting primary research at a young age, and firsthand, hands-on experience with currently cutting edge technologies. Where are the requirements for this?
- This needs reviewing by actually professionals in the field. Though people with many years in the education field may know a lot about teaching technique, it does not mean they know a lot about science. Clearly, non-geologists wrote the earth science sections which is inherently a huge problem as it misses the point of Earth Science and kids will know the name of clouds better than they will about the aquifers around them and natural processes that occur and are relevant to the rest of their lives.
- 687.
688. This is moving our childrens education towards denying evolution. Evolution has scientific basis. This religious right woman trying to pass this crap off as science education should be fired.
689. I think the draft could be adopted if the word evolution is put back in.
690. See comment above
691. NO! Evolution is a prove theory, with over 100 years of rigorous scientific testing, and examination from all over the world. These standards do not help children learn, they do not help teachers teach, and they are poorly written. Take your Christian agenda to some other state, please. Remeber science is true whether you personally believe in it or not.
692. The state should not prioritize its political agenda over the needs of our students.
693. Do not amend anything that waters down the teaching of evolution or that otherwise promotes so called intelligent design.
- Please do not adopt this draft without including additions:  
Educate students at all grade levels with age-appropriate information about the concept of carrying capacity and the importance of living sustainably with their ecosystem for human health and well-being; this could include discussion of the Ehrlich and Holdren (1971; Science) relationship between impact to the environment (I), human population (P), per-capita consumption (A), and the environmental damage (T) inflicted by the technology used to supply each unit of consumption (I = PAT). Further discussion of the science behind climate change and how human-caused climate change is affecting our environment, economy, and human health and discussion of potential solutions.
- 694.
695. If these standards to get adopted this year, I would hope that we wait a year to implement them to give teachers time to properly prepare.
696. Evolution should be taught, clearly, in our schools. Anything otherwise is a violation of the separation of church and state.
697. I fear these children will be put at an enormous disadvantage.
- The standards 8.L4U2.12 & HS.L4U3.31 are vague and misleading. As a state that is in the bottom 5 in the country, we need to raise our standards and rigor, and these standards, written in this way, do not do that.
- 698.
699. This draft does not clearly emphasize proven scientific facts and information in at least one important

aspect specifically that of evolution vs. creationism. Evolution is not a theory much less one theory among many. It is proven science with years of archeological evidence and research to back it up. Creationism on the other hand is a religious belief. Different religions and cultures have different creation stories but these stories although handed down thru generations have no physical evidence to prove their accuracy. If Arizona is to compete with other states and countries in science, math and technology, schools must teach children information that is based on facts, not religious, cultural or political views. Religion belongs in churches, temples and mosques.

700. No.
701. Needs to be revised back to the original draft before evolution was eliminated for intelligent design. Intelligent design needs to be eliminated from the science standards.  
I'd like to comment on what I understand is the desire of State Superintendent of Education Diane Douglas's desire to weaken the Standards as they refer and relate to evolution. Her recorded suggestions reflect a lack of understanding of evolution. It is the cornerstone of biological science. Yes, it is and will remain a "theory" as this term is used in science - an explanation that is subject to testing and, if testing underscores the strength and applicability of the explanation, eventual
702. confirmation - just as the theory of gravity has proven to be applicable in all but the smallest scales of physics. Proposing other explanations for changes in biological life forms over time is simply not scientifically valid. Most other explanations are based on religious belief without the benefit of rigorous testing. I recommend two books that lay out this argument in much more detail: "Ever Since Darwin" by Stephen Gould and "The Blind Watchmaker" by Richard Dawkins. Please do not approve any change to the treatment of evolution in the standards.
703. Remove the content that tries to spin science toward religion.
704. This draft is missing foundational information. It is important to make sure a diverse group of scientists and educators provide feedback on the draft of this document, which could have huge impacts on our youth. Please do what's right for our students, our earth, and the integrity of the scientific method.
705. NO...we are already the nation's example of poor education. I cannot imagine scientists and business leaders with school-age children choosing Arizona as a place to pursue their careers. There will be an economic price to pay as well if these ridiculous standards are put in place.
706. We need evolution taught in AZ.
707. should not adopt discussion on intelligent design
708. Creationism is not science and has no place in science standards to be taught in public schools. The argument that evolution is "just" a theory and therefore creationism as a theory is equally valid is incorrect. Scientific theory is a method of explaining and interpreting facts, Creationism is a faith-based construct. Religion belongs in church, not in public schools.
709. The constant attempt to inject irrelevant personal religious Creationism beliefs into classes about science (truth and reality) would be laughable if it wasn't so pernicious and corrupting malleable minds.
710. I would recommend more discussion, revision, and comment before approving the standards.
711. No. Don't do it. Don't. Please.
712. Do not embarrass Arizona's educational institutions (as well as yourselves) and compromise our children's education by adopting this fundamentally flawed draft and revisions to the previous standards. Reject it and seriously reconsider whether Diane Douglas is qualified to hold the post from which she has proposed these harmful changes.
713. The elimination of evolution is inexcusable. The idea that "creationism" has even been considered for inclusion is ridiculous.
714. Do not adopt this draft, or any other that is based in opinion and not science.
715. Any modern scientific standards that ignore major conclusions from scientists about climate change, evolution, and big bang cosmology are not sufficient science standards. These are the conclusive results of the research from the scientific community and cannot be simply ignored because politicians disagree with the scientific findings. It is not their place to choose these standards. The standards should be chosen by qualified individuals with science degrees and backgrounds.
716. No. In contrast to the current science standard, the changes made to scientific, well researched topics such as The Big Bang Theory (pg. 62), evolution (pg. 4, 20, 27, 30, 32, 42, 44, 46, 64, 69, and 72), and climate change (pg. 21, 25, 40, and 60) are disturbing and worrisome. I fear for the future of Arizona children if we actively discourage learning about actual well researched scientific theories.

717. You need to put evolution back in the standards. It is the defining theory for evolution and should be given that respect by teaching our kids.
718. Not yet.
- Please remove the revisions to the big ideas proposed by the committee. These revisions were made in a non-transparent manner and were not vetted by the committee. Furthermore, the original process did not include the option for the ADE to make these revisions. Specifically, L4, P4, U1, and U4 should be returned to their original wording. Lastly, U3 should be changed from "The knowledge produced by science is used in engineering and technologies to create products" to "The knowledge produced by science is used in engineering and technologies to develop solutions to problems." This is a more accurate statement because engineering is not about creating products (a neoliberal perspective on engineering) but is about solving problems.
719. produced by science is used in engineering and technologies to create products" to "The knowledge produced by science is used in engineering and technologies to develop solutions to problems." This is a more accurate statement because engineering is not about creating products (a neoliberal perspective on engineering) but is about solving problems.
720. Return the standards language to what the panel of science educators wrote.
721. The Board should in no way adopt this draft of the Science Standards. They do not represent what the actual scientific community needs students to understand.
722. Absolutely not.
723. Removal/replacement/minimizing evolution is completely unacceptable.
- Please reconsider the changes made to the 2004 standards, and document and publish the justifications (i.e. changes in the scientific community) that have driven the need for changes to be in content.
724. justifications (i.e. changes in the scientific community) that have driven the need for changes to be in content.
- I am vehemently opposed to making the proposed changes regarding removing or qualifying the subject of evolution. In no way should this be considered and frankly it makes me consider moving out of this state should this actually occur.
725. subject of evolution. In no way should this be considered and frankly it makes me consider moving out of this state should this actually occur.
726. The current standards are unacceptable with the current omission of evolution. Adoption would be catastrophic for the future of science education in Arizona.
727. Absolutely not!!!
728. Draft needs to be adopted minus the changes the state superintendent unnecessarily put in.
- The DRAFT AZ Science Standards corrupts and dilutes the theory of evolution and opens the door to religiously biased views while rejecting sound science. Do not weaken our students' scientific curriculum and please utterly reject this DRAFT of the Arizona's Science Standards.
729. religiously biased views while rejecting sound science. Do not weaken our students' scientific curriculum and please utterly reject this DRAFT of the Arizona's Science Standards.
730. Allow science to be taught i.e. scientific method, no religious interference. We will teach our own children about religion at home & in church.
731. EVOLUTION
- Leave the theory of evolution alone, and stop conflating its existence with some sort of imagined attack on Christianity. If parents want to teach their children Christianity, that's their right. But the public schools are not an appropriate place for any religious discussion, and that includes eliminating valid scientific theories from the curriculum simply because they don't appeal to Christians. The theory of evolution and the idea of creationism are NOT mutually exclusive, so there is no conflict. Please stop trying to create one at the expense of intelligence and reason.
732. valid scientific theories from the curriculum simply because they don't appeal to Christians. The theory of evolution and the idea of creationism are NOT mutually exclusive, so there is no conflict. Please stop trying to create one at the expense of intelligence and reason.
733. No, they should not adopt these newly written standards. A committee of educators should be reviewing and revising these standards.
734. Keep Evolution in the science standards!!!
735. Do not include creationism in schools. Church can teach this story to the full extent it is useful in student's education.
- The theory of evolution needs to be taught in school. Colleges expect students understand and be educated on this subject, and so many careers. Deleting the word and using analogies is childish and immature.
736. educated on this subject, and so many careers. Deleting the word and using analogies is childish and immature.
737. Ignoring the scientific consensus that is evolution is irresponsible & dangerous. Stop trying to dumb-down the next generation.
738. i disagree with the removal of the work evolution, and the apparent attempt to pander to those who do not understand or approve of it's science.
- The State Board of Education should reject the March 18 draft (and if there is a more recent draft should make it much easier to find on the site). Science teachers should have the final say in this area, not a politician.
739. should make it much easier to find on the site). Science teachers should have the final say in this area, not a politician.

740. Untill the above mentioned problem is addressed it does not reflect proper scientific rigour, and approach to viable research methods and standards.
741. Absolutely not. That's not educating. That's choosing what students should 'believe' this is not about faith, this is about science and scientific exploration and facts.
742. Science in public schools shouldn't be dictated by personal beliefs.
743. My primary concern is that the standard reflect the dominant scientific opinion and not over-emphasize niche or alternative opinions which might confuse students regarding the veracity of existing scientific consensus. If the state can address this particular issue and improve the sections addressing evolution to meet the existing scientific standards, then I would support it's adoption.
744. Do NOT adopt these standards. They do not adequately represent science-real science.
745. I don't recommend adopting this draft as written. Evolution exists and not teaching it is unjustifiable. It will take AZ backwards in education.
- I urge the following revisions before the Board of Education adopts the proposed standards. These revisions would address shortcomings outlined in my response to section 15 and are justified in section 13.
1. Include more precise definitions on natural selection and biological evolution. The current standards have these definitions and they should be retained.
  2. The proposed standard lacks a robust treatment of Earth's energy balance and resultant climate. The proposed standards should retain facts from the current standards pertaining to global chemical cycles (already emphasized throughout the proposed standard) atmospheric composition, energy budget, temperature, climate, and weather.
  3. Mineral geology and the technology of resources extraction substitute for unrelated topics in the proposed standard; specifically resource competition in the biosphere and socioeconomic decision making. These topics are fundamentally related but should be disambiguated before the standard is adopted.
- 3.
747. Absolutely not! This draft represents all that is wrong with having a person with no education knowledge or experience running the education department. Beliefs do not belong in the science standards.
748. Do NOT adopt. You will be facing many lawsuits.
749. Refer to scientific theories by name and allow students to obtain the evidence provided to support the theories.
750. The alteration of references to evolution and fundamental misunderstanding of what a theory is do not reflect the scientific process or the overwhelming consensus of the experts in their fields.
751. As taxpayer-funded institutions, public schools are constitutionally obligated to teach a religiously neutral curriculum based on the best available evidence and science. Our kids need to be prepared to compete in a scientifically-sound world. Colleges and universities use evolutionary basics and build on this in advanced science classes. We can't give our kids a second-rate education. We must demand the best.
752. Please consider revising the life science standards for K-2 at least.
753. Before the State Board of Education approves these standards, the key concepts need to be removed and the language of some of the standards needs to be review by the science educator group. Science is a precise language and small modifications can impact the science learning target. As much as possible, the language used in the standards should match vetted, science research documents.
754. No, the state should not adopt this DRAFT as Arizona's Science Standards. This DRAFT has not been developed with the required rigor and input of people with direct knowledge of the science information covered by the standards.
755. Adopting this DRAFT as Arizona's Science Standards would be a huge step back for the quality of public school education in our state.
756. The disconnect between key concepts and the standards is concerning. These documents need to more work!
757. I disagree with adopting this draft of the new standards.
757. I believe the standard only needs minor revisions but i didn't want to check "agree" because i don't



- agree you should accept this as written.
758. Please, DO NOT teach my children that there is a flying fairy man in the sky. Thanks.
759. Read concern in #11.
760. Until real scientists from respected science institutions complete this with out outside influence this will be unacceptable.
761. Please take more time to review it.
762. Please adopt Next Generation Science Standards. They offer a progression that makes sense and keep AZ students at a competitive level as we prepare them for college and career readiness.
763. No, not without revisions of language referred to above.
764. Add new science information ie- epigenetics and biomimicry. Rigor has been reduced and organization is unclear.
765. The key concepts should be removed.
766. The attempt to omit evolution from science education in Arizona is misguided, and based on a fundamental misunderstanding of both evolution and the nature of science itself.
767. Why didn't the committee just use the NGSS? After all, AZ was an NGSS lead state and had input into the final version of the NGSS. Using the NGSS would have been the best return on investment and produced a more coherent, research-based document. I recommend scrapping this current version and adopting the NGSS.
768. Go back to stronger Science Standards. I could never have gotten into medical school with such squishy soft teachings such as creationism.
769. It would be an embarrassment to adopt these standards that are so clearly influenced by personal religious ideas. Religion is a different subject than science. The two can certainly coexist, but we should not present them to young people as the same.
770. The changes to the original draft complicate the standards, whereas this new Draft is not adoptable.
771. These standards should absolutely NOT be adopted.
772. Evolution has been proven to be scientific fact, termed a theory in the scientific community. The lay public sometimes understands the word theory differently. Your watering down of the wording regarding evolution is disgraceful. You should consult with reputable scientific institutions for corrections.
773. This draft as published should not be adopted. The standards should return to the document constructed by the committee of science educators prior to the internal revision.
774. The Board absolutely must not approve any set of standards which are intended to weaken the appreciation of science and of how science works. Science is different from theology. It is predicated on observation and on the rigorous, constant, empirical testing of ideas. It is open to "scientific revolutions" where our previous understandings are replaced with new ones based on new findings. But science is built up over centuries with findings that are replicable. To deny or to seriously question the theory of evolution on theological grounds and without any compelling scientific evidence is reprehensible, just as it would be to suggest that the earth is flat or that the sun revolves around the earth or that the earth is at the center of the universe.
775. It seems clear that there is an effort in the revisions to the 2018 standards draft to remove or undermine evolution as an accepted biological model. Diane Douglas is a known opponent of evolution, and in a recent forum has expressed the desire for intelligent design to be taught in schools alongside evolution. This is despite the fact that the case *Kitzmiller v. Dover Area School District* found that even "teaching the controversy" around evolution, let alone directly teaching intelligent design, is academically dishonest and merely an attempt to undermine modern scientific thought. Douglas also has no background in science or education thereof, so such significant changes to the wording of evolutionary standards are without solid expertise in any supposed problems with evolution. The many revisions to the standards regarding evolution, in addition to the complete removal of the name "Big Bang theory", suggest that Diane Douglas is attempting to downplay or excise scientific concepts that she feels run counter to her own personal views. This is unacceptable, and the standards should be revised so that they reflect the most current scientific models, not the individual beliefs of the superintendent.
776. Not with Diane Douglas' changes.
777. I firmly believe that ADE should not adopt this draft as AZ's Science Standards. I believe it would serve the children of AZ much better if we would just adopt the Next Generation Science Standards.

778. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
- Absolutely not. The State Board of Education has an ethical, moral, and scientific responsibility to represent the discipline of science in a way that reflects the evidence base of scientific research, not ideological conservative interests. Lacey Wieser at the AZ DOE, a highly respected and hardworking educator in our state for more than a decade, resigned in protest of the current standards. The rewritten standards do not represent the interests of the majority of Arizona parents, educators, and students.
779. When revising the school standards, you need to follow the advice of your own curriculum designers and teach evolution as what it is - undisputedly the most accepted biological theory when it comes to how living things got their form and function. There is no room for myths and pseudoscience in a place of learning.
780. The original draft, before the recent changes made by the ADE, should be adopted. All the changes made by the ADE should be stricken.
781. No,because it is absurdly detailed and because language relating to evolution and cosmology has been obscured.
782. In my opinion it would be a mistake to adopt this DRAFT of the standards and it would represent a move backwards for Arizona's students. Several years ago, the National Academy of Sciences produced a well received and research-based Framework for K-12 Science Education. The National Academy is a non-profit, non-governmental organization whose work is recognized as the gold standard of synthesizing scientific research which can then be used by decision makers. This Framework was then used by Achieve and lead state partners (of which Arizona) was one to write the Next Generation Science Standards (NGSS). For Arizona to back track and not adopt the NGSS is illogical. Arizona helped to write these standards which incorporate the latest research about science teaching and learning. Furthermore, to use the Big Ideas of Science document produced by the Association of Science Education in the United Kingdom makes little sense. In addition, combining the Big Ideas document with some pieces of the 3D science instruction described by the Framework and then layering Key Concepts on top of that has produced a document which bears little resemblance to best practices for teaching science and in parts is an incoherent and scientifically inaccurate representation of the world.
783. I also have to comment on the way this process has taken place. While the production of state standards has traditionally been more about politics than education, the actions of ADE take this to a new level. Groups of educators from across Arizona gave of their time and expertise over the last year to work on these new standards. While there were elements of politics in these meetings - we were told that we could not just suggest that we adopt the NGSS, the people there worked in good faith. To have the results of that work be wholly revised by the ADE in a way that changes the fundamental document is a blatantly political and shameful move on the part of ADE.
- This draft is a big step backward for Arizona. We need to move forward and adopt the Next
784. Generation Science Standards (NGSS). Arizona participated in the development of the NGSS as one of 26 lead states in the nation.
- Developmentally appropriate and age appropriate standards should be considered. Expecting students to master abstract concepts at 9-10 years old is unwise and uninformed about how children learn.
785. Young students need to be able relate to their learning through observation and hands on activities. These standards need a thorough review with an eye towards developmental abilities to understand the concepts.
- I have reviewed carefully the draft Internal Review and urge that it be adopted in its current form.
786. The Internal Review allows greater teacher and student freedom of inquiry in the science context, and that is all to the good.
787. Adopt with some extensive revisions.
788. Playing down or eliminating references to evolution are a major problem and should not be allowed in scientific education.
- As stated above, this draft is not well refined, or designed. It has some items that are improvements compared to the 2004 standards, but lack the organization, depth, and guidance needed to meet the needs of students in Arizona.
789. Arizona's State Board of Education should NOT adopt this draft. What should be adopted is the Next
790. Generation Science Standards, which educators from AZ helped to write! It is more comprehensive than this draft and it is grounded in solid educational practices.
791. Please do not adopt these standards. Arizona's reputation as a cultural backwater has suffered

- enough. We have charter schools aplenty to teach the kids about how "Jesus gave us guns to defeat the dinosaurs!" Please don't make me get politically active - I'm an old, tired military vet and I have had it with my tax dollars being used to teach kids someones fantasies.
792. I do not agree with the idea of teaching evolution as a theory.
793. The Next Generation Science Standards, or NGSS, would be a significant improvement over the current draft of our science standards and their adoption would represent a fiscally responsible choice made by the state.
794. DO NOT adopt these standards with the alterations that make the document blatantly false and anti-science!
795. Please don't adopt this draft so long as it deletes the word, or the full and proper teaching of, evolution.
796. If the school board is willing to ignore all of the scientific facts that support evolution, then they are in no position to modify the scientific curriculum that our children are taught. Science is based on FACTS, not on personal beliefs and religious ideation.
797. Please see my comments above for specific concerns. I also wanted to note that, even though I went to a parochial high school and even got weaker scientific instruction than some of my peers, I was still grateful that the teachers taught evolution as it is meant to be taught, as a strong scientific theory that has continued to hold up to centuries of scientific inquiry and observation.
798. This is a piece of garbage from top to bottom. The Supreme Court has already decided this, keep your personal religious beliefs out of the school. I don't want my tax dollars being spent to spread your personal fantasies.
799. Diane Douglas has nothing but her own interests in mind and it is an embarrassment and an affront to AZ teachers to be handed this nonsense. WHY DID SHE CONSULT WITH AN OUT-OF-STATE RELIGIOUS COLLEGE ON OUR SCIENCE STANDARDS? I refuse to believe there is any educational pursuit in that connection. The Arizona State Board needs to hear our voices and reject these science standards until they reflect current scientific knowledge. Isn't that the benefit of updating standards? To use the most relevant data? Especially if you're going to keep these standards for another 10+ years.
800. The state board of education needs to restore the evolutionary theory which was removed. Otherwise I feel the standards are extensive and cover all needed areas of study.
801. Absolutely not. You are making our state a laughing stock.
802. Arizona's State Board of Education should not adopt this Draft as Arizona's Science standards.
803. I do not agree with the removal and modification of the word evolution in Arizona's Science Standards.
804. This DRAFT should definitely NOT be adopted. Arizona students will be at a distinct disadvantage if they are not taught the full scientific basis and truth about evolution. Our public school students deserve better.
805. They should not adopt.
806. Should not adopt the new standard.
807. Yes, as long as creationism is not taught to students and evolution is not undermined in our schools. I find it very worrismatic that this is even an issue in AZ.
808. Evolution is omitted.
809. I have taught at the college level for many years (astronomy, physics) so I don't feel qualified to make an in depth comparison. But given the number of problems I see with this set of standards, I would be very dismayed at their adaption. A good teacher could probably work around these, but a beginning or barely qualified teacher would have a very hard time.
810. It is the responsibility of parents to teach our children about intelligent design. This theory should not be taught in schools as it has no sufficient scientific evidence to be deemed science.
811. Please revert to the vernacular provided in the final draft provided by the committee of educators, limiting any changes to the realm of spelling and grammar.
812. With life-science modification.
813. Science classes must teach proven science and not religion. The science standards as written by science teachers should stand. Evolution must be taught so that students are well-educated and prepared for life. Anything less puts AZ students at a disadvantage.
814. Intelligent design should not be taught in Arizona's public school science classrooms.

- This is something I say to my classes every year when evolution first comes up, and I believe that it is relevant here. I say: Many of you believe that God is involved in the creation and maintenance of the universe. That is ok. There is nothing wrong with believing that. I myself believe that God blows on chromosomes. But there is a difference between faith and proof. My job as a science teacher is to teach you what we can prove. I can't tell you why the universe exists, or what your purpose in life is. That is a question for religion or philosophy. My job is to teach you what we can prove about the way the universe works. We don't know all the answers. That's a good thing. It means we're still asking questions and learning, which is the whole point of science. Some people will tell you that they can prove that God is involved in evolution or science, but they can't. Some people will tell you they can prove He isn't, but they're lying too. The reason is that good science needs a control group to compare our results to and be sure the thing we think is causing the changes is really causing the changes. To prove whether or not God is really involved, we need to set up a God-free box with a separate universe to compare ours to. That isn't possible, because by His very definition, God is everywhere, so we will never be able to do this. This means that God's role in the universe remains a matter of faith. What I have to teach about evolution is a matter of proof. There is no shame in belief, and be sure you remember what belongs to your faith and what belongs to science.
815. The science standards as edited in this draft should NOT be adopted. It is disturbing to discover that the obvious, undeniable importance of biological evolution has been severely compromised in the science standards. This seems to be a glaring attempt by creationist influence to confuse children and create doubt concerning the fact that evolution is the best explanation for life on earth. I recommend throughout the standards, instead of using "theory of evolution," that simply "Evolution" be used. We all know that creationist dogma states that evolution is "just a theory." Most importantly, the separation of church and state must be maintained. Children must not be distracted by religious dogma in publicly funded schools - especially as it pertains to matters of science.
816. Teach evolution. Evolution is science.
817. Arizona should definitely NOT adopt any curriculum that teaches religion or religion-based ideas. Children need to learn about reality, not ancient stories made up by simple people to explain why the sun appears to move across the sky or where rain comes from. They need critical thinking and logic to be competitive with other nations who will NOT be teaching fairy tales as fact to THEIR kids.
818. No. No. And again, no. Evolution is science. Creationism is the Judeo-Christian explanation of how life began. Not science. Simple.
819. The draft needs to refer to evolution as an accepted principle in science. It is obvious that some editors of this document do not understand the scientific method, primarily in the use of the term "theory". In science, a theory is considered the best current explanation of testable data; theories are supported by significant bodies of evidence and by independent tests by multiple knowledgeable researchers. The theory of evolution is the only logical, tested, evidence based explanation of biological diversity. It is universally accepted across the scientific spectrum. On a purely grammatical track, sentences containing the phrase "The theory of evolution seeks to..." need to be re-written. Theories don't seek anything, since they are inanimate concepts. These sentences could be re-written as "scientists explain biological diversity using the principles of evolution".
820. A second critical science concept that is poorly covered in the standards is climate change. Whether one believes global warming is anthropogenic or not is irrelevant. We need to learn NOW all we can about changing climate and the effect on human life. The terms "global climate change" and "global warming should be implemented as early as 9th grade.
821. KEEP the new changes so evolution is not taught as LAW. It should be taught as a theory. This allows students to examine evidence and make up their own mind. It lets us teach students how to think critically, looking at evidence, rather than to just believe whatever they are told. Lets us teach how to think, rather than, what to think.
822. Please do not send our schools back to the dark ages, removing evolution is unacceptable.
823. The new state standards need to reflect the scientific consensus regarding evolution. To teach anything else disadvantages Arizona's youth as they graduate from high school. The scientific community is united regarding evolution and our teaching should be too.
824. You work for the state board of education not a parochial school board therefore your language which casts a shadow of doubt about evolution and opens the door to your creationist fantasies is absolutely unacceptable. The Eyes of Arizona are upon you.
825. Total idiocy - absolutely not!
826. We would be doing our students a disservice if we adopt these inaccurate & incomplete standards.
827. Again, the inclusion of creationism, and the weakening of the teaching of evolution. Creationism it's not a science but a religion belief. This is a science class, and science is what should taught.

828. If you plan to teach creationism, I will make it my personal mission to bring suit against the department of education for civil rights violations.
- We need to adopt the next generation science standards. So many resources are already available for teachers! This draft of standards is a mess and our students deserve better. Please consider adopting the next generation science standards instead- that would be best for our students
829. If evolution is taught in conjunction with the word theory (which is okay because technically it is), the word "just" should never be included. Furthermore, kids need to be taught that there are different strengths of theories based on the amount of evidence for and against it. I fear that this does not occur (as it didn't when I was first taught what a theory was). Creationism is a theory in that it is an assumption based on limited information or knowledge; a conjecture. Evolution is a theory in that it is a set of statements or principles devised to explain a group of facts or phenomena, especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena. If this is made clear then adopt your draft.
830. As long as the standards are amended to remove one woman's religious beliefs and the issues surrounding homeostasis are addressed, these standards would be better than what we have.
831. Don't adopt until Creationism is removed .
832. Evolution is a valid scientific theory and the word "evolution" should be part of a competent student's vocabulary and background knowledge. If the theory of evolution is taken out of the standards then along those same lines, the theory of gravity is invalid too!
833. It is an improvement and corrects some of the religion of "SCIENTISM"s Dogmas which have "defined" out of existence the very valid theories of Intelligent Design and only included "Evolution" as "science
834. Edits questioning evolution are unacceptable and will disadvantage Arizona students in higher education. Science standards must include scientific research published in peer-reviewed journals, including evolution. Religion and intelligent design should not be included in science standards. I am appalled by the Arizona's Board of Education's edits.
835. I prefer the use of "Theory of Evolution" to simply stating that there is biological diversity. The process is science!
836. The standards have omitted mention off evolution, a core tenant of science. This is unconscionable.
837. No. The changes related to evolution give question to it's validity. Moreover, it strips confidence from scientific findings.
838. What is with the word organism? Changing it to "species" in the learning objectives, changes things. An organism shows signs of life a species is a group of organisms. People should learn about organisms and species. These are not interchangeable.
839. NO. Please do not adopt these standards! They are incorrect.
840. The weakening of evolutionary science has no basis in fact but rather in religious ideology. Ideology must not be represented in science. Alternatives to evolution have very little acceptance in the scientific community.
841. The language being proposed by Superintendent of Public Instruction, Diane Douglas, regarding elimination of specific references to "evolution" and evolutionary science are unacceptable and offensive. They fly in the face of scientific consensus about such facts. She doesn't seem to understand that scientific "theory" is not the same as, say, philosophical theory. Keep teaching the facts about evolution. Otherwise, our students will lag far behind the rest of the world in the ability to think critically and objectively. And I'm saying this as a Christian ministry who believes God created the world. Evolution doesn't negate faith.
842. Evolution is highly-plausible scientific explanation of the origin of life on this planet based on countless fossils, artifacts, and observations. It is also a highly-likely demonstration of why humans share so many genes with other fauna. Evolution has an important place in the teaching of science and should never be slighted or discounted because it does not fit the particular mythos of an elected official.
843. While I support the draft Science Standards proposed by the working group, I cannot support adoption of the standards following internal editing by the Arizona Department of Education. The diminishment of evolution in these standards is not in the interest of either the state of Arizona, nor the schoolchildren entrusted to your care. I'm sure that others have described to you how evolution is not 'merely' a theory, but is the basis for all modern biology. I'm sure you also have read numerous examples of how understanding evolution is important in medicine, agriculture, and biotechnology. Please let me provide you my personal perspective:

As a graduate of Arizona public school system (1994), I understand that our students want the best



possible educational opportunities. They are not interested in being pawns in political battles.

As a professor at the University of Arizona, I understand that giving Arizona schoolchildren an incorrect, incomplete, or biased science education sets them behind their peers and results in lost time and money as they face remedial science education.

As a faculty member in the College of Agriculture, I understand the competition among students for experiential learning opportunities. Students with a weak or faulty foundation in science lose out on those opportunities, which can never be recovered.

As an internationally-recognized scientist studying genetic and evolutionary mechanisms ([goo.gl/eTwbuW](http://goo.gl/eTwbuW)), I understand the career prospects for those who understand evolution, as well as the desire of Biotechnology companies for a well-educated population.

As a parent of children who were in the British school system for a time, I understand that basic scientific principles are not questioned in the rest of the Western world.

As a former postdoctoral scientist in the UK who helped to train students at Cambridge University, I understand that the world does not sit by while we waste time debating science from the last century. Others are moving forward and taking the jobs in Medicine and Biotechnology for which our students are ill-prepared.

As a parent of schoolchildren in Arizona public education, I understand that it is not my children who will be harmed by this. My children will not be sheltered from the word evolution - they will learn from their mother that evolution describes the beautiful diversity around them and that evolution has an impact on their daily lives.

As a proud citizen of Arizona, I understand exactly who will be harmed by the Department of Education's interference in the Science Standards: it is all of us. To grow our economy and build a better future for our state, we will need to ensure that our students have the best education we can provide so that they are prepared to take the jobs of tomorrow.

Although I applaud the efforts of the working groups to articulate and align science standards across all grade levels, and especially their recognition that evolution has a place in even the earliest grades, the internal review of these documents by the Department of Education has destroyed them. Diminishing evolution in these Science Standard is not only unreasonable, it is unconscionable for those who claim to have the interests of Arizona and her schoolchildren at heart.

844. Again, let me state...evolution is not a theory but a proven, evidence-based concept. It MUST be part of the scientific curriculum

845. I strongly disagree with Evolution and the Big Bang Theory being presented as Law. These are theories only. In addition, the Bible account of how the world began should also be taught as a theory so that students can be given all the theories and room is left for parental guidance, as opposed to government indoctrination.

846. Return full respect for the scientific standards in biology with full respect for the central role played by evolution, and stop misusing the word theory in a non-scientific sense for a scientific context.

847. The State Board of Education should only adopt these standards after removing attempts to dilute concepts about evolution and the cosmos, and return to the originally proposed language. Also, since many of our elementary students study about the desert, they should receive accurate information about how some of our native plants reproduce.

848. As a scientist who earned her PhD in the Department of Ecology & Evolutionary Biology at the University of Arizona, and now a mother with a son in the Tucson Unified School District, I am deeply dismayed to see last-minute changes made to the science standards about evolution, including replacing the word evolution with "biological diversity", and modified phrasing that attempts to frame evolution as "just a theory", paving the way for alternative <beliefs> to be taught alongside evolution. It does our children and our society no service to go down the path of replacing evidence-based knowledge with religious beliefs about origins, i.e., place them alongside one another. Science should be taught in science classes; religion should not be taught in science classes. The separation of church and state is at the foundation of our democracy, as is high-quality public education. The erosion of facts and the emergence of "alternative facts" are deeply dangerous to our society; we cannot let this happen in our schools. Our understanding of evolution as fact is the basis for many improvements in agriculture and medicine, to name just two, and to present evolution as just one idea among others is incompatible with continuing to make advancements in these fields.

849. The updated organization, concepts & depth of information will surely be an upgrade for public school

students in Arizona. That being said I think it is an absolute outrage that the board is giving serious consideration to scrapping teaching evolution and teaching a version of creationism. This administration touts religious freedom but what it seems like they're doing is pushing the religion they believe on everybody's children which is disgusting! Supreme Court ruled that religion should be kept out of school so parents can teach/instill whatever faith they wish without having it shoved down their throat in school, in one of their mandatory science classes. I would be outraged if my kids had a religion/faith forced on them because the Republican Party happens to believe in that religion/faith! If they do set this precedent it's only a matter of time before all faiths/religions will have to be taught in school which is ridiculous! Parents have plenty of options at their disposal if they want their kids to have a religious Education! What r they going to do about the non Christian kids whose beliefs do not square with the beliefs of the Republican Party! They claim they want religious freedom HOWEVER the second ppl with a different faith started pushing their faith & wanted their beliefs taught in school these ppl would throw a fit! They want the freedom to push the religion THEY want onto everybody else, but if you disagree with them too bad! They DO NOT want YOU to have religious freedom! They want you to agree with them! The point of Religious freedom AND separating Religion from public education is that students/parents have the freedom to NOT be religious, not learn about creationism, and an expectation that what is taught in a required science curriculum is in fact grounded in scientific fact! I find it extremely ironic that within the "Science" curriculum they are pushing something that is not scientific in any way and can never be proven scientifically! Where does it end? That being said the Republican Party doesn't seem to value science anymore anyways which is a really scary path this country is going down...

850. The Constitution guarantees that no state religion shall be established, and this draft supposes that Christianity is the law of the land.
851. Intelligent Design should be taught at home or church
852. Only SCIENCE in Science class!
853. when 4 of the 5 candidates for education secretary support creationism, it is a sign that we are moving toward a theocracy in this country. We should be raising children who are free thinkers; present them with all views and allow them to think for themselves. And not reflect the narrow view a handful of politicians.
854. Keep the theory of evolution in the standards.
855. Proposed changes regarding evolution. One of our country's founding ideals was "Separation of Church and State". Minimizing evolutionary theory and promoting religious beliefs belongs in Sunday school, not in public funded institutions. Our children need to be taught science based on reality and facts, not "someone's" personal religious agenda.
856. As a community member who is in the process of starting a family and plans to raise my children under these standards, I will be very glad to see these improved standards implemented in our schools.
857. Religion does not belong in school. That is personal/private issue. Religion should be a family issue, it has no place in the classroom.
858. This needs an affirmative rejection of religious suppositions such as intelligent design.
859. I strongly disagree with the wording and lack of depth, in the standard about biological evolution. "...that the process of evolution may result from natural selection." This is way too soft, as it is considered a theory since there is NO actual evidence to its contrary. The standard should be written so students must state several of the myriad pieces of evidence the up hold the theory of Natural selection.
860. Absolutely not! Teachers must be allowed to teach what science has proven, not what misinformed leaders "believe" to be true that is not FACT based, such as intelligent design. Keep our children learning 21st century knowledge, not 2000 year old fairy tales. Reject these rules!
861. In relation to the removal of the environmental impact.
862. If you teach intelligent design from a christian viewpoint you MUST teach creationism from Hindu, Buddhist and other religions whose stories are just a valuable fot children to learn.
863. Yes, the truth needs to be taught. You need to be opened minded to acknowledge the truth. Just to go along with, 'this is what we were taught' is not right. People used to believe that the world was flat too!
864. No, it needs to update and strengthen teaching on climate change and evolution. If we are to prepare students to be the problem solvers of the future it is of utmost importance that they are provided with this information and the opportunity to critically think about these issues.
865. Evolution needs to be included as a part of science standards for the state. We are putting students at

a serious disadvantage if we leave this important subject matter out of our students' education. Those writing these standards should be experts in science and/or education.

At a minimum they should understand what the word "THEORY" means in scientific terms.

866. Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
- Also: Our US Constitution guarantees the separation of Church and State. Please let's have those who want to enforce their religious dogma on public school kids keep their religion to themselves. Our family values are centered around secular science education, not partisan, religious based curriculum. Please leave Evolution as part of science curriculum and eliminate Intelligent Design in the Science Standards.
867. This draft should not be adopted. Its implementation would put Arizona's students at a disadvantage compared with students from states where science is recognized.
868. What was in the original Draft was watered down in the final review.
869. Revisions related to evolutions and related topics are unnecessary, apparently political, and detrimental to the overall quality of education in Arizona. The draft should not be adopted.
870. Arizona's State Board of Education should reject this draft and stop letting Betsy (I hate public schools) De Vos and the Koch brothers jerk the board's chain.
871. If standards are adopted in July, we are expected to teach them in Aug. 2018. The summer isn't enough time especially when we aren't on contract, especially when the standards are still in draft form and not officially adopted yet. We need to wait 1 more school year to be implemented. I really hope this happens because I am not ready to adjust almost an entire year's worth of content/curriculum to fit the changes they made for next year.
872. The Arizona Science Standards are a political interpretation of science that are unfounded in the laws of nature and nature's science. Therefore; Darwinism, natural selection, evolution and other related terms are it is vehemently objected to, and are not to be contained or utilized in the standards. I am qualified to state this as a scientist, engineer, instructor and teacher even to the university level.

Darwinism natural selection and evolution terms are fraudulent assertions not supported by science. Science has confirmed in order for life to transpire it takes three things to complete the process simultaneously. 1. Proteins, 2. RNA and 3. DNA. There has been not scientific test or reasonable proof to any of the various elements of which some have tried to prove these three terms or subject matter.

Critical analysis of a hypothesis or theory cannot be conducted unless other alternatives are studied, examined and tested. The standards do not offer any alternative and led one to believe that no such one will be allowed. The standards are permitting the subject matter to be taught as truth. The entire science standards are based upon this untruth. The standards do not promote an alternative scientific explanation or other truth but require a student to be tested upon this...once again an untruth. It is not only unwise to teach a lie to children, but unethical and immoral.

Science – n. 1. Knowledge as of facts, phenomena, laws, and proximate causes, gained and verified by exact observation, organized experiment, and analysis. 2. Any of the various branches of such knowledge, as biology, chemistry, physics (natural sciences); economics, history sociology (social sciences); agriculture, engineering (applied sciences); 3. Any department of knowledge in which the results of investigation have been systematized in the form of hypotheses and general laws subject to verification.

Darwinism, natural selection and evolution are hypotheses not theory. The term "hypotheses" is utilized because these three topics though similar have not met the scientific qualifications to be termed a theory in whole or part.

If Darwinism, natural selection and evolution were true then it would be self-evident through this process alone that no two things could exist within the same time line, it's impossibility. Humans are the only living being that has a conscience...one to know right from wrong, the ability to learn progressively, the capacity to love and be loved and to have empathy... just only to name a few. So where did we get it from.

[https://www.jw.org/en/publications/videos/#en/mediaitems/AllVideos/pub-ivwc\\_1\\_VIDEO](https://www.jw.org/en/publications/videos/#en/mediaitems/AllVideos/pub-ivwc_1_VIDEO)  
<https://www.jw.org/en/publications/books/was-life-created/>

874. See comments to 13 and 15. Get rid of "intelligent design." Restore references to evolution.
875. NO! Conservative Christians should keep out of public education.
876. Creationism has NO place in a science classroom. There is 0 evidence.
877. The removal and alterations regarding evolution are not acceptable. Evolution is the unifying theory of biology and it has withstood 170 years of testing, not to mention the discovery of chromosomes, the structure of DNA, and genetic sequencing. There is no disagreement within the scientific community in the veracity of this idea. Students in science class should be taught SCIENCE and to minimize the importance of evolution and their ability to understand these essential concepts does a disservice to our state's students. Diane Douglas' personal agenda and beliefs should not be allowed to override the committee of 30 individuals who created the first draft of the science standards.
878. Please modify the language of this draft to meet accepted science standards such as those employed by the College Board.
879. They absolutely should not.
880. Absolutely not and it's authors should be sent back to school for some remedial science instruction.
881. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
882. Science classes MUST include a thorough exploration of the Theory of Evolution to remain relevant and competitive with the rest of the world.  
Creation Science may be covered if it is also represented as a Theory.
883. Evolution needs to be a part of the standards and edit-outs should be reinstated
884. My continued admiration for teacher who read these standards and figure out how to incorporate them into their classes. The changes around the issues of evolution are appalling. My work is religious education and I would never teach anything that smacks of intelligent design or indicates that evolution is questioned by real scientists. It is insulting to teachers and to students to include this in "standards" and will continue to convince people that AZ schools are inadequate.
885. I am very happy that this draft contains  
L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.  
and does not include the theory of intelligent design.
886. The accurate and thorough study of evolution needs to be reinstated. This draft would result in ill-informed students without crucial understanding of the way the world works and unprepared for any scientific higher education. That would be unacceptable.
887. Please see previous comments.
888. The edits made to the document are strongly deleterious, not only because they misrepresent and weaken science, but also because they are poorly done and betray a lack of pedagogical rigor or even basic understanding of what educational standards are supposed to look like, or what they are for.
889. The content selected in the science standards strips out evolution, an essential scientific topic with rigorous evidence supporting the existence of the process. Scientific study is not stochastic and the education awarded to our students should not be selected on what religious zealots decide. If adopted, the scientific standards would do a great disservice to our students, as it arbitrarily decides what merits scientific study and what does not, based on religion. There is a reason for separation of church and state. Providing students with only the information you deem is reliable, based on religion, not science, drags our students backward, not propels them to critically think. But that is not what you want. You do not want independent, free thinking future leaders, but a bunch of tame, placid sheep, who think the exact same way you do. The argument that you want to present both sides of an argument and allow the students to decide is a complete misnomer, as you strip out evolution from the education standards. Furthermore, you cannot appear to be unbiased by promoting one side of an argument, creationism, that has no basis in scientific fact, and suppress the rigorous, multi-faceted studies that prove of evolution's process occurring at this very moment. If the Arizona State Board of Education adopts this draft, it will be a profoundly scary combination of both arrogance and ignorance. Arrogance in believing that the board can decide that they think they know what is best for students without scientific merits and ignorance to science itself. It is laughable that the Board of Education would ignore evidence of scientific study and claim to be looking out for the best interests

- of Arizona students. Unlike science, the Board chooses to ignore evidence to draft a policy. The board should operate more like the scientific community, where studies that show evidence of reliability of a concept are adopted, while theories and crackpot ideas are ignored due to lack of evidentiary merits.
890. As a physician scientist, I want the authors names on the document
891. Needs to include evolution and climate change
892. Please review public comments in good faith and make revisions.
893. The standards should reflect the truth about evolution and not unproven religious beliefs of a radical Christian minority.
894. I feel the Arizona State Board of Education should adopt the Next Generation Science Standards, or something much more aligned to them, rather than this draft of these standards- which inhibit teachers from collaborating with other educators across the country to provide great science lessons and resources for students.
895. We should be teaching science, not religion in our schools. If you want children to learn religious theories, they must learn them at home or in their church.
896. This draft standard should not be adopted as is because of its unscientific handling of evolutionary biology.
897. Evolution should be present in the standards.
898. What was in the original Draft was watered down in the final review.
899. The usage of the term "theory" for evolution is not accurate. There is abundant scientific evidence that evolution is fact, not theory. Teaching our children that evolution is theory is wrong.
900. NO. Do not promote "your" concepts/religious beliefs through the Science Standards. It is not only unconstitutional, but presupposes that your personal religious beliefs are the ONLY acceptable belief system for Public Education.
901. Intelligent Design (stated or implied) should not be on a par with teaching the scientific theory of evolution. This does not serve our students.  
[I like a lot of the rest of the standards and feel the revision needed is mostly in this area. However, it doesn't feel right to click on "agree" when I think this is a big issue.
902. Please do not let one unqualified religious lapperson to override science experts on the subject of evolution.
903. As the standards are written now, they should not be adopted.
904. The lessening of the importance of evolution in biological change is not supported by science or scientists. Evolution is the glue that holds biology together and helps explain today's life. The lessening of the importance of the big bang is not scientific. These standards should reflect science and not ideology, any ones ideology. Today's students need the best scientific explanations for how the world and universe work. Science has one explanation, there are not competing credible scientific theories.
905. This draft was made to add religion to education. If you want to add religion add religious classes as electives and not try an hide them in science.
906. There is overwhelming evidence supporting the process of evolution. Do not change the wording with respect to this process.  
Please do not adopt science standards that move us backwards.
907. By modifying language regarding evolution you are pushing religious mumbo jumbo  
On AZ students. Public schools should teach the facts or relevant  
Theories and leave religious beliefs for Sunday school.
908. Educational administration has stepped way over the line in tweaking science concepts to align with personal beliefs. Review by content experts is needed to make sure the educational standards are truly educational. Evolution has pervasive application in cross cutting concepts that has been entirely ignored.
909. As stated above, I think there needs to be some changes with the biology standards to better support the teaching of the theory of evolution.
910. Areas that are generally considered, in the scientific community, fact should be stated as such. For example, in the Life Sciences section, the last portion about evolution appears to identify evolution as something less than scientific theory...as if there could be other relatively widely held alternative scientific options - this is not the case.
911. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.



912. Absolutely NO!

If ADE did not change the draft as part of the internal review, I would have rated this as agree. There are some moderate revisions that are needed to the actual standards - look at the number and grain size in grades 3-5 so they are consistent with other grades. However, due to the changes that ADE added in both making the content inaccurate, inappropriate for some grade levels, and shifting the focus from concepts to content, I cannot support the state board adopting this draft. I hope they soundly reject it.

914. No. These proposed standards do not reflect honest science.

Please engage with relevant national professional science associations such as the NABT and the AAAS while reviewing these standards, and incorporate their feedback into the final draft. Please allow science teachers to have another chance to review these standards before they are finalized.

916. This draft should not be adopted.

917. Add more materials

While the majority of the draft is appropriate for science standards in the public schools, there should be some revisions made on the teaching of the theory of evolution. In order to help the students become critical thinkers and problem solvers, teachers should be allowed to teach both the strengths and weaknesses of Neo-Darwinism. This is reinforced by the fact that there is still unresolved controversy among prominent scientists regarding the evidence related to it (specifically macroevolution); many of these are evolutionists but have openly critiqued Neo-Darwinism. A large portion also aren't American and thus are not as well known, commonly resulting in a popular belief that there is unanimous consensus regarding the evidence. Of particular concern among these individuals is the ability of natural selection to create the vast diversity of life forms today given the high deleterious-to-beneficial mutation ratio, and also the extrapolation of direct observations of significant evolutionary advance in bacteria and viruses to larger species for which such observations cannot be made (including potential extrapolation of micro to macroevolution). Probability and the vast rate at which species appear in the fossil record (ex. Cambrian Explosion) ought to be points of discussion as well. The Science Standards Draft states on page 76 that "science cannot advance if scientists are unable to communicate their findings clearly and persuasively or to learn about the findings of others. Scientists need to express their ideas, orally and in writing...and by engaging in discussions with peers." Thus, without a thorough evaluation of the strengths and weaknesses of Neo-Darwinism, the development of students as scientists and critical thinkers will be hindered as opposed to reinforced.

918. Do not stop teaching evolution in our schools. Encourage those who disagree to disadvantage themselves and not me.

This draft should NOT be adopted. The removal of evolution is detrimental to preparing Arizona's youth for their futures. "Intelligent Design" does not belong in any draft. It should remain in the religious institutions that support it. This is completely unacceptable.

It's factually incorrect to claim evolution is not a proven science. Please do not commit the future students of Arizona to false science education. Evolution is a proven science and should be taught as such.

919. no - we need to teach our students about scientific theory and evolution as well as keep very separate our church and state.

The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.

920. Since our education is science-based and there is disagreement on evolution among scientists, evolution should be incorporated as a theory and not an absolute. There is lack of both evidence and continuity in the fossil record. Therefore, teachers should be encouraged to teach both the strengths and weaknesses of the theory.

921. No religious beliefs should be involved in educating children about science

922. Do Not implement these as AZ science standards. Keep the existing ones in place until they can be reviewed and possibly strengthened as applicable.

923. The recommendations of the committee, without the changes to evolution, must be put forward for comment, not the version with changes made unilaterally by the Superintendent and her staff.

924. See above

925. No. They need to be much more rigorous and evidence based.

930. Yes!!
931. Needs to remove creationism. That is a subject for family, church or philosophy
932. See above. Am a pastor... many Christians have no problem w/ evolution. Do away w/it and set back modern biology which is based on it.  
Science by definition is based in theories and documented facts. Creationism is faith based and thus
933. teaching it reflects specific religious beliefs and thus is also a violation of separation of church and state.  
No, not until evisions are made. We need standards that are going to be 100% applicable and correct
934. before they are implemented. Because of the long time in between revisions, we need to make sure that everything is good before it goes out; these may not be changed for several years.
935. Evolution is not a theory!
936. Very wrong not to teach proven Science...
937. Evolution is proven by science and needs to be put back into the standards.
938. They should not, if the editing done by the State Superintendent is allowed to stay.  
Evolution should be taught in science class.
939. Creationism may be taught in church. Their choice.  
Mythology does not belong in a science class.  
We need to prepare our students to represent current science to compete for industry in Arizona and
940. to prepare them to compete on a global scale. Do NOT use the science curriculum to inject disbelief in these kids. Science is based on data and facts.  
The overall good work done by the drafters of these standards has been overshadowed by the Department's proposed deletion of any reference to evolution. This is a highly retrograde act, and one
941. that will have serious and long-term repercussions not only for Arizona's students, but for all Arizonans who would like to see our state economy flourish through employment opportunities that would be available in the science and technology sectors but for the belief of employers in those sectors that Arizona espouses backwards education in the sciences.
942. As above
943. Lessening the significance of evolution in the standards by removing the word or using qualifying language is a step backwards.
944. do not remove the teaching of evolution from the standards. We must prepare students for college.
945. It should not be adopted because of its unscientific handling of evolutionary biology.
946. I do not want it adopted. I believe in separation of church and state. The only schools religion should be taught in is private school or church classes.
947. Please teach evolution and not creationism
948. If Sup. Douglas' edits to the standards are EXCLUDED, I'd support adoption.
949. Adopt!
950. SEE COMMENTS ABOVE
951. Why are you excluding creation?  
The Board should NOT adopt the standards as posted without addressing concerns about evolution, climate, change and other modifications which were added during the internal review. The standards
952. should give students the opportunity to investigate evidence and conclusions based on the interpretation of scientific evidence through the same science practices we are asking them to apply. The standards should not interpretations based on non-scientific values or belief systems.  
UNDER NO CIRCUMSTANCES SHOULD THIS DRAFT BE ADOPTED. It is clearly highly politicized. There is no need for creationism to be taught in non religious classes. It is clearly written by a religious and
953. politically driven committee to impact the next generation for their own folly. It is shameful. Stick to educational basics and elevate our students with a taste of the exciting world of discovery that will soon be theirs.
954. Today my state is a national joke.
955. The previous draft was a better grouping of standards. If the goal is to get a higher level of thinking,

- change the amount of standards for each grade, but not the core area of science that they belong to.
956. no
957. teaching creationism is ridiculous it is NOT science
- I am concerned with the expectation of 45 min. Per day of instruction time— 30 min. Maybe is more reasonable or 3-4 days instead of 5.
958. Not all weeks are full weeks throughout the year and there is still a need to teach social studies in addition to the necessary time needed for language arts and mathematics.
959. No- evolution belongs in standards. See above
- For sure, as the current controversy over Dianne Douglas' ideas regarding the teaching of evolution is in the news, we college educated teachers need to implore the board of education to adopt science teaching standards based on the current, up-to-date scientific research.
960. The teaching of "Creationism" or any content alluding to "Creationism" has no place in any educational setting other than an overtly and specifically religious setting which is group specific. The enforcement of a particular religious view on the general population has in previous history been the basis for horrific genocides and injury to many millions of people. That is the basis of ISIS, with whom this country has been at war. The Founding Fathers of this country were very aware and specific on that point. Many of our Founding Fathers were not Christian in the modern hate mongering and dogmatic sense, but were deists. Again, look at ISIS, or at the history of Europe. Any sort of religiously based standards must be excluded from education standards. Individual religious groups may teach anything that they wish in their religious contexts. Including religious based beliefs into the public educational standards is only a few steps away from a Christian version of Sharia law. Religious law is against everything that this country stands for and everything that makes this nation strong.
961. Religious law is against everything that this country stands for and everything that makes this nation strong.
962. Yes, but creationism should NOT have any place in SCIENCE standards.
963. See comments above.
- Please adopt this 2018 Draft as written. I would not be in favor of any amendments or revisions.
964. I'm a Registered Nurse and Public Health Nurse and father and believe in strong science based education for a healthy AZ future.
- Heck NO! The new K-12 science stands which remove Evolution and include ANY aspect of creationism will make Arizona even more of an educational laughingstock. More importantly, please leave any religious teachings out of public education -- you know, that whole separation of church and state.
965. Creationism is religion & should not ever be taught as "science". If Creationism is to be taught, then all creation origin stories should be taught, from all religions & cultures (like Native American tribes). Keep science separate from religion! We do not need to waste taxpayer money on court cases. Evolution is a scientifically proven standard. I am a Christian who believes in it.
966. They should NOT adopt the draft with the revisions made by Douglas and her group. Please adopt the standards as originally written by the group of educators.
- The current (2004) standards are fine. The proposed changes regarding the removal of "evolution" and "Big Bang Theory" are an affront to intelligent, educated people and these changes have no place in in the Arizona State Science Standards!!
967. I think that the draft is well thought out and should be implemented as it extends science content better throughout the grade levels. I also feel that the concepts are grade appropriate.
968. Please do not equate the scientifically proven theory of evolution with creationism. There's a important little thing called separation of church and state. Please don't embarrass Arizona.
969. After you put evolution and big bang back in
970. Should not adopt and return to previous standard.
- The draft should ensure to exclude creationist dogma and remain consistent with science based evolution and natural selection. Creationism should remain out of a government funded classroom. Allow the parents of our student body to decide on what supplemental teachings are appropriate for their children not the public schools. If Arizona is going to raise its standing of its public education system, we should focus on science and math curriculum that is based on scientific evidence and logic. Introduction of religious based teachings will only dilute the effectiveness of the curriculum. Arizona has long road to being a recognized as a model state for public education, I strongly recommend to stick to the basics and excel before introducing controversy in its agenda.
971. DO NOT get rid of evolution standards. Religion has no place in the public school classroom. Please
972. DO NOT get rid of evolution standards. Religion has no place in the public school classroom. Please

- remove the religious rhetoric like "intelligent design" and other ambiguous language in the evolution standards. Evolution is a vital topic in biology and we would be doing a serious disservice to our students and the quality of education state-wide if you adopted these standards as they are in this draft. DO NOT adopt this draft.
975. They should not reduce teaching of evolution and should not teach creationism. Evolution is fact. Creationism is religion.
976. I feel that this draft especially in the areas that deal with evolution, natural selection and astrophysics , like the big bang, have been watered down undermining scientific method and critical thinking skills putting our students and the public at risk making it easy to believe in pseudo sciences.
977. Evolution is a central tenet of biology. Tempering with its full and proper teaching is unacceptable.
978. They should not.
979. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
980. You should not adopt this draft. Students need to learn about evolution—a theory that connects to a multitude of subjects and interdisciplinary issues. I would not be in the position I am today—a college student studying psychology, public health, and anthropology—without first learning about evolution. Please do not fail our students; provide them information and help guide them in broadening their knowledge base. As a student of the Arizona school system, I have consistently been disappointed in how you choose to approach education. Our students are the key to the future, the key to our success, and they need to be prepared as possible.
981. I do not think the Arizona's State Board of Education should adopt this DRAFT as Arizona's Science Standards because I do not think they will help Arizona students learn as well as standards from other states will. I think the formatting is difficult to read, and that the "plus" tables are not helpful, and will actually end up harming student's learning as many of them will not be taught things that are on the "plus" list because some teachers will only feel like they need to teach the "essentials." I also think these standards are trying to show that we are pushing for science and engineering, when really we are just changing some words to other words. I do not think that these standards will benefit the students in Arizona.
982. If you want kids to learn religion do it in church not science class
983. See above regarding greater rigor in the use of "evolution."
984. Standards around teaching evolution must not be weakened.
985. Mrs Douglas needs to join the 21st century.
986. See comments to question 13. In addition, students should be exposed to scientific principles including that incumbent theories are not sacrosanct but may be challenged with empirical data and logic (such as Newtonian physics was challenged by relativity and quantum physics) and certain phenomena are properly outside the realm of science (e.g. the cause of the Big Bang). Methodological naturalism should be introduced but with the caveat that that does not imply or require philosophical naturalism. (Too bad that philosophy is not explicitly taught in our schools or the philosophy of science could also be introduced. However, teachers should be taught these subjects.)
987. I am glad to see that the "scientific method" is being expanded to cover various methodologies as well as engineering practices as there is no single scientific methods but numerous methodologies. This attempt to remove evolution from the standard curriculum is simply absurd. It has also already been decided by two judges to be unconstitutional to teach intelligent design, and besides whatever happened to separation of church and state?
- Douglas needs to realize that silly faith and religious beliefs belong at home or behind closed doors, not in the classroom.
988. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
989. I hope to see a fair and equal treatment with regards to ID theory in the future draft. But this is good so far.
990. Removing evolution goes directly against the national guidelines.
991. For all the above reasons.

992. Leave creationism OUT of SCIENCE classes. You are forces your BELIEFS on others.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
993. Again, I feel that the current Science Standards are more than adequate, in fact are superior to the proposed standards. Having said this, the draft standards should not be adopted.
994. See above.
995. Words are important. Our students should not have words changed and removed to appease those who do not believe in science. Please ensure our AZ students receive accurate scientific information, including on evolution.  
Please do NOT make changes that remove or downplay references to evolution and the big bang made by Diane Douglas. These changes, made to support a religious agenda by a person who is on the record as supporting "intelligent design" (which is about as scientific as believing that Mickey Mouse controls the weather) would doing our students a great disservice by removing or mumbling through references to genuine scientific principles and theories. Because they are supported by rigorous scientific research, data and real-world observation, evolution and the big bang are scientific theories. The "intelligent design" driven Ms. Douglas supports is based on religious beliefs and have no place in public education.
996. Standards that seek to introduce religious belief in the guise of promoting honest scientific exploration cheapens the quality of science education in Arizona. If approved, educators and parents throughout the state will successfully resist. Galileo's legacy is secure, and history's arc does not look backward.  
The draft is insufficient if the goal is to prepare Arizona's children for the 21st century. Language in the draft revolving around biological evolution is weak, and confused. Nothing in biology makes sense except in the light of evolution, and the draft standards soft peddle the scientific consensus on evolutionary change. Putting evolutionary biology fully into the curriculum, and showing how it allows us to predict when and why disease outbreaks occur, select for locally adapted crop species and varieties, and prevent multiple drug resistant bacterial strains from forming is a must. In the absence of evolutionary biology medicine would still be where it was in the early 20th century. In the absence of teaching evolution in the 21st century our graduates will be unable to participate in the revolutionary changes occurring in gene sequencing, genetic engineering, and ecosystem conservation and management.
997. Evolution is the scientific explanation for how the world has evolved. Keep religion out of the schools.
998. Absolutely should not adopt this new draft for science classes in AZ.
999. Please reject these modifications. Arizona is already so far behind other states in our educational standings. We need to increase the rigor not reduce it with religious poppycock.  
I strongly oppose the changes made by the Superintendent of Public Education, which have severely weakened the science standards. The wording in the area of evolution and climate change was altered without any scientific review. I object to them because these changes fail our kids. Instead, please adopt critically reviewed Next Generation Science.
1000. Don't adopt this 'standard'. It would be better to just do nothing.
1001. Do NOT accept any standards that deviate from SCIENCE  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!  
It is 2018, not 1618. The teaching of science should include the scientifically-proven information about evolution. If not, maybe students should learn that the earth is flat, that the earth is only 6,000 years old, and that the sun revolves around the earth.
1002. See comments above.
1003. The answer to question 13  
Evolution should be taught as FACT, not theory. Keep the teaching of evolution in the science standards. Also, striking the Big Bang Theory is UNACCEPTABLE.
1004. Teaching or even referencing Intelligent Design is UNACCEPTABLE. Keep religious theories out of PUBLIC schools.
1005. NO!!!



1012. SBE should reject this DRAFT. To do otherwise is to place Arizona students at the back of the line as it were. The SPI is not fulfilling her job description of serving the needs of our children, and should be removed from office for this attempt to damage the public school system, which is our greatest democratic institution.
1013. Include the science of evolution
1014. Changes to sequence of standards in elementary grades is problematic. Because these standards are specific to Arizona and not aligned with the NGSS, it will be difficult to find curricular and assessment materials that align.
1015. No, it needs further review and input.
1016. This is educational malpractice. There is no place for this kind of material in Arizona public schools. The bible should be taken seriously but not literally. The separation of church and state is an integral part of our country and a line that should not be crossed.
1017. The Board should not adopt the standards as currently revised. Deemphasizing evolution and the big band is really, really bad science instruction.
1018. Until the above comments are addressed it should not be adopted. Period. Stop pushing religious based agendas on the citizenry of Arizona. Science is science. Keep it that way.
1019. They should not adopt this draft. Teaching evolution is critical for students to be prepared for higher education after high school. It is not a theory. Religion has no place in public schools.
1020. The addition of religious material is not appropriate. Science must be fact based and verifiable. Creationism has no basis in fact.
1021. NOT teaching evolution as fact perpetuates Arizona's 49 th of 50 place in school quality. This woman's RELIGIOUS opinion should not be school policy!
1022. With the exception of the changes related to the removal/watering down of the science of evolution, most standards appear to be founded on real science. I do have questions about how the geology sections are taught, however, particularly in regard to the age of the earth.
1023. These standards should not be adopted. They remove basic tenets of scientific understanding and do not reflect the views of the majority of Arizona. They will hurt our national reputation, they will prevent families from relocating here for fear of our backwards science education (which is everything right now), and more than that, they will hurt our students. You cannot graduate having never heard of Darwin, Evolution, or the Big Bang Theory and be competitive in any scientific field. This is a huge mistake.
1024. Definitely not. Our Public Education system is formed under the umbrella of our Constitution which guarantees the separation of religious doctrine to the private area and not into the Public sector.
1025. Absolutely not. Many of the changes are needed clarifications, but there has clearly been a concerted effort here to censor out evolution and other topics that a few religious extremists find objectionable.
1026. Further explanation of important science including the differentiation of theory, applied science, pure science, law, evolution etc
1027. Absolutely not. The changes introduced by Superintendent Douglas specifically betray political/religious/cultural biases that have no place in science education. Science and math are the two single subjects where what is, is.
1028. The new standards would only downgrade the educations of our students, and put Arizona further down the road to academic second class status.
1029. Second hand reports however report dogmatic changes to an already weak science curriculum. As a higher education graduate of science and medicine in both california and pennsylvania, and having a 10th grader, I tell you az science is weak. Students advancing in education in any other state will be disadvantaged. Don't make it worse by confusing science and religion.
1030. Absolutely NOT.
1031. Evolution is science. Please do not diminish its importance and do not dumb down science education in our school system. Intelligent design is religion and should only be taught in Sunday school.
1032. The state and its districts are unprepared to take on these new standards. They don't have a sequence of logic. Each grade level is being completely gutted from the old standards and there isn't any direction as to how to acquire material for these new lessons. Also, not recognizing evolution is a political move that does not belong in science and even more so, education.
1033. This needs major improvements. The original layout of what we were teaching in each grade made way more sense. This makes no sense. Students do not retain what they are taught for years before revisiting it again. It makes no sense for 8th grade to get tested in what is taught in 6th and 7th grade.

1034. They need to spend more time looking at these standards and what is best for students. This draft is not ready to roll out now for teachers to do their jobs well and to help students.
1035. The draft needs more edits and better organization.
1036. Please just organize it better and include some other sciences!
1037. I think the BoE should extensively modify the draft standards.
1038. I don't think I can fully comment or make an educated evaluative statement until the new standards have been tested in a classroom.
1039. (see # 15). This draft should not be adopted until any/all references to creationism are removed.  
Please spend more time on this draft before putting it into practice. Please work on choosing better essential standards- just the most important ones. Please work on better key concepts sections and
1040. do not just throw words into the column. Choose only the most appropriate and allow teachers to build around these. These standards should be a FRAMEWORK of standards and an explanation of 3D methods via crossover concepts/technology and engineering. Simple is better.  
Once again, with a low emphasis of essential standards tied to chemistry it makes chemistry a difficult class to fit into a sequence of courses for students to take. Ultimately, these chemistry
1041. essential standards will have to be absorbed by other non-chemistry courses (meaning someone who is not highly qualified to teach chemistry will be teaching chemistry standards). This is considering that the test that covers the new 31 essential standards is given at the end of the junior year.
1042. Remove the higher level Earth/Space standards, add more chemistry standards
1043. No.  
Absolutely do not adopt these standards with the deletion of evolution. Evolution is science. Religious
1044. beliefs related to how nature emerged and changed are not science -- they are spiritual in nature. The court systems have again and again supported evolution in schools.  
page 4 core ideas. L4 "theory of evolution" change is bad.  
page 9 Grades K-2...reject (formerly the scientific method)
1045. leave scientific method in document. Reject this sentence "Suggestions for key concepts and connections to other content area standards are included to assist teachers when implementing the Science Standards and are not intended to be the minimum or maximum content limits. "  
Superintendent Douglas's stealth attempts to eliminate real science--specifically evolution and cosmology--from the state's standards and replace this teaching with religion-based guesswork is unacceptable. Contrary to her assertions, evolution and cosmology (specifically the "Big Bang" theory) are based in extensive and solid science. Her claim that both are "just theories" demonstrates an inexcusable ignorance of how science determines that a proposal should be granted status and credibility as a theory. To reach that status, a theory must:
- Acknowledge and account for its assumptions;
  - Be the most accurate and comprehensive explanation of the known facts about its subject;
1046. • Make non-obvious predictions;  
• Be testable, and have survived attempts to disprove it;  
• Be able to evolve to accommodate new facts—or be discarded if it can't; and  
• Not be accepted merely on the say-so of a single individual or small group.
- Real scientific theories also draw on the knowledge generated by other theories.  
"Intelligent design," no matter how it's disguised, meets none of these criteria. Attempts to sneak it into Arizona's science teaching curriculum, especially to replace legitimate science, must be rejected.
1047. No!
1048. I strongly disapprove of these standards.
1049. See prior answer. The standard cannot be adopted as written.  
Referring to evolution as only a "theory" when the vast majority of all biological standards we know
1050. and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined.
1051. Limiting the study of evolution, eliminating the word EVOLUTION & replacing it with a religious based belief is crossing the line between the separation of church & state. It would also teach our children false information and make them ill prepared for college. Keep your ignorant religious beliefs out of public education.

- Yes, you should. You should also stop teaching Evolution all together, because there is more proof for Creationism than there is for Evolution. You can't prove Evolution! Anyone with common sense knows that each kind reproduces after its own kind. No one "evolves" into something else. It is obvious that a
1052. divine creator was in charge from the beginning!!  
Cows come from cows, cats come from cats, horses come from horses. Humans do NOT come from MONKEYS; never have, never will! Shame on Governor Ducey for even standing up for such a ridiculous teaching such as Evolution.
- Arizona should adopt Next Generation Science Standards. As DaNel Hogan pointed out in the Arizona
1053. Daily Star, Arizona was one of 26 states creating these standards. educators would have access to teaching materials, and it would be fiscally sound because we have already invested in this.
1054. It's important that references to the Big Bang Theory and evolution remain in the standards; students will be expected to understand these as they continue their education.
- We have to stop pushing religious ideas into what is strictly a logical and scientific academic endeavor.
1055. Religion belongs in religious institutions. Public schools are not religious institutions. Intelligent design / Creationism has no place in a science classroom.
1056. You need to explain and teach FACTUAL science, which includes evolution!
1057. Definitely not! (See above)
1058. The State Board of Education should NOT accept the draft version.
- Deleting the word and concept of evolution, as well as big bang, is wrong because it ignores the
1059. difference between science and religious belief. It also violates the constitutional separation between church and state. Leave religious teaching to parents and leave science to the scientists. Keep evolution in the standards.
- Referring to evolution as only a "theory" when the vast majority of all biological standards we know
1060. and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined. Additionally creationism or anything pertaining to this should be excluded from any scientific public education.
1061. As long as creationism stays in the church, where it belongs.
- Please consider changing the Science Standards HS.L4U2.31 and HS+B.L4U2.20 to include evolution.
1062. Our students will be poorly prepared to continue their studies in science without a good understanding of evolution.
- I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
1063. If you read my previous comments it will be very apparent that I do not approve of watering down and dumbing down of peer reviewed science in any form or fashion. I also believe in the separation of any church/belief system and state. I do very much believe in the study of comparative religions and the teaching of religious tolerance, respect and freedom. The study of science and religion are separate and should remain so.
1064. To quote Gov. Ducey "Science and religion belong in separate topics in the classroom".
1065. Remove the modifications requested by Diane Douglas, and restore language that conforms to current scientific consensus. Religious views do not belong in a science curriculum.
- Follow Gov. Ducey's advice and teach religion in classes about religion, not science class. Teach
1066. science in science class not a (or a few) religious beliefs unless you are going to teach all religious beliefs and present it as such in a fully comprehensive way.
- Addressing the change of removing evolution in 8th grade and high school is absurd. I do not support
1067. this change and believe it will hurt the state through science teacher recruitment, student intellectual preparation and state ranking of education.
1068. I do not believe the Arizona State Board of Education should adopt the current DRAFT.
1069. Absolutely not. This is an obvious attempt to funnel more money into private schools and I am not falling for it. Nor should anyone in any community.
1070. My wife, passed away from glioblastoma in 2014. She was so close to immune therapy and the new things that a local Arizona laboratory had to offer and it makes me wonder.  
If these scientist in Arizona had to wade through the falsehood of untruth to get to the things that they had to learn to get to these great scientific advancements in the treatment of brain cancer, a great injustice was done to my wife.  
If today's students and future scientists have to wade through the untruths of intelligent design to get the information that is true which is represented by evolution, it will delay the great advancements in

- science that can only be achieved by students with their heads on straight learning what they need to learn without the confusion of superstitious, mythical nonsense.  
Please do the right thing for everyone depending on science for the future of us all.
1071. The changes related to biology/evolution open the door to a degraded science education and should not pass. Specifically, opening the door to intelligent design or the like is not acceptable.  
Creation is not a fact, is not science, and SHOULD NOT be included in science classes. The world is a small place & our kids will need to compete with many others for good jobs. To get those good jobs of
1072. today & tomorrow, they will need a proper education in science & math. Including religion in today's science curriculum will leave our kids unprepared to compete for the good jobs they will want and need in the future.
1073. I believe the changes I have identified should be addressed before these standards should be adopted.
1074. Needs to retain references to evolution
1075. I don't believe AZ should write their own science standards when we could adopt the NEXT GENERATION SCIENCE STANDARDS that were created by 26 states (AZ too)! Now I understand that AZ wanted to write their own so that we could distort the teaching of evolution! This is a perfect example of why AZ is at the bottom of the education ladder!
1076. As I said earlier. NO the standards should remain as they are currently structured.
1077. This draft should NOT be adopted unless the concerns articulated above with regard to the removal of direct references to evolution are satisfactorily addressed.
1078. Religion based science is NOT science. Get it out of the SCIENCE standards.  
Do not adopt. Manipulating specific words on such an important discipline hobbles our teachers and puts our students behind their peers in other states. We must be progressive enough to teach and
1079. allow our students meaningful academic inquiry. Even though Diane Douglas is an elected official, one person alone should not interject their personal beliefs as a lasting legacy. Put our students academic rigor first and leave personal opinions at home.
1080. Evolution and the big bang are not suggestions. They are actual science. Keep narrow minds out of science.  
I would like to comment in regards to the topic of evolution. As a Catholic Christian, we believe in both religion and science. Father George Lemaitre proposed the Big Bang Theory. We can't ignore scientific facts. We view the Bible as a whole library full of different genres. Allegory is a symbolism device used in writing to explain the meaning of an abstract concept. The Bible contains the use of allegorical writing. Not all of the Bible writings should be taken literally. We have the freedom and confidence to follow scientific exploration where it leads us. We aren't scared of science because we know that good science is the pursuit of truth and All truth leads to God. God's plan is how he wanted things to work. How things work is science. God guides the science. Genesis is not to be understood as a literal chronological account. It is written by topic. Written for an ancient audience. It is written symbolically about events that did happen and science explains how it happens.
1081. The changes regarding evolution and The Big Bang are not improvements, but degradations of science. These changes seem motivated by both religion and politics, not scientific fact. The word
1082. 'theory' was inserted to downplay the factual basis and large body of evidence supporting evolution. It was not inserted in front of any other well-held theory because is often confused with speculation or hunch, not fact-based evidence.  
Religion is not science and it not fact, and SHOULD NOT be included in science classes. The world is a small place and our kids need to compete with many others for good jobs. To get the good jobs of
1083. today and tomorrow our kids need a proper education in science and math. Including religion in science class will put our kids at a disadvantage when competing for the good jobs they will want and need in the future. The education we provide our kids should broaden their options for the future, not limit them.
1084. See item#13
1085. Please do not adapt these changes in the standards. They are thinly disguised efforts to allow non-scientific (i.e. religious) concepts in science education.
1086. leave the political ebb and flows out of science. also leave out religion - sunday school, catechism, church and religion classes are the places for that, not science classrooms.  
Why should evolution be removed from the standards. It can be taught along with creationism. But by
1087. removing it from the standards you are pushing a topic that is believed by Christians, therefore, pushing religion on students. Need I remind you, there is separation of church and state in this state. By removing evolution and pushing creationism, you are infringing on this separation.

1088. KEEP the word EVOLUTION in the standards. Evolution is accepted science . There are NO alternative theories that are no religiously based.  
Teaching of religious theory is not and should not be allowed in our schools. No other religious theory
1089. is taught in any other school standard. Evolution in it's entirety needs to be taught in our public schools.  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
1090. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."  
Definitely. We need to make science fun and engaging to take away some of the intimidation kids can have to it. Science is a way of rationally studying the world around us, an important skill to have
1091. regardless of what the kids do in the future. We need to adopt teaching standards that prepare for the tech-heavy, rapidly advancing world. I urge you to approve next generation standards as soon as possible and not be swayed by anyone besides science teachers and experienced public school leaders.  
To make this insidious change is to personalize a document that has been effective and changing words or substituting them will not replace the facts based science. I wonder what your educational background is Ms. Douglas? Your personal ideology needs to stay out of public school agendas and what is taught therein.
1092. As University level instructor I can attest to the fact that our current students do not arrive at University with adequate scientific reasoning skills. We are doing our students a disservice by not providing them a rigorous, scientifically accurate education in primary and high school. Please do not muddy the waters on evolution, the origins of the universe and climate science.
1093. NO. Please revise to be consistent with fundamental scientific concepts and the 21st century.  
As with the Constitution's separation of church and state the public school system must separate
1095. religious doctrine from scientific fact, for example, evolution and the big bang theory. Stop inserting your own religious beliefs into school curriculum
1096. No! To D.D. and all her henchmen - please stop trying to subvert science with your theological beliefs. It's bad enough we have a entire army of home-schooled ninnies to contend with.
1097. see 15 comment
1098. If the elimination of the term 'evolution' is an attempt to placate people who believe in certain religious traditions instead of something that offers clarity or better outcomes for Arizona students, I do not support it. Reading the revisions, many places seem anodyne, but by the same degree then, they seem unnecessary. Religious education can take place in the home or the church, but should not be part of public educational curriculum or AZ-sponsored standards.  
Religious beliefs have a protected place in our nation. Those beliefs are not to be dictated, changed or supported one over another by government action. The path to salvation or enlightenment my be through study and following those religious beliefs. However, religious beliefs are not subject to scientific methods and have no place in our science curriculum.
1099. I support the public oversight (ASBE) of all standards but action should only be taken where it benefits the public at large and not as a reaction to personal (religious) opinions of members. Please see Kitzmiller v. Dover.
1100. I am troubled by the dilution of the scientific method and teaching scientific rigor. I don't understand why Science and Engineering are treated as one thing - they are quite different. I'm uncomfortable with inserting 'both positive and negative', while provocative, it implies that there are only two impacts: positive and negative. There may be neutral and multi nuanced impacts. I think this inserts unnecessary false dichotomy. Of course, removing the words 'evolution' and 'Big Bang theory' are just silly and indicate a lack of understanding of the business of science.
1101. KEEP THEOLOGY OUT OF PUBLIC EDUCATION
1102. Adopt only if you want the reputation of advancing ignorance.  
Accepting these standards will make Arizona education an even greater laughingstock of the US
1104. education system (and the world). Evolution needs to take a prominent role in science standards, and religious ideas have no place in science standards.
1105. Please keep THEOLOGY out of public education standards
1106. original draft should be adopted
1107. Same as above. Stop trying to de-emphaize or remove evolution and the big bang from school



curricula.

1108. This DRAFT should be soundly rejected, as it is without merit.

1109. Core idea, L4. This should be changed. Evolution is a fact, not just a theory.

1110. Some of the internal revisions already added weaken the concepts and objectives.

1111. Until we can establish standards that will serve our future generations and prepare them for coming challenges and teach them about the past and the mistakes therein, any standards should not be accepted.

1112. This being the second decade of the 21st century, we should finally lay to rest any suggestion that evolution is somehow flawed or not accepted by the scientific community. We should also stop trying to confer any scientific validity on a religious tract's metaphorical description of the creation of the universe, and the planet on which we live.

1113. Because of my opposition to the attempt to sneak religious doctrine, or at least unfounded skepticism, about evolution by natural selection, I AM STRONGLY OPPOSED to the draft that attempts to discredit a settled science.

Do NOT adopted these standards ! The proposal to eliminate Evolution as a term is terribly upsetting and simply a disguise for the evangelical conservatives to inject their version of Christianity.

I've lived in Tennessee and have presented talks on human evolution. Students essentially know nothing about the concept due to the unwillingness of teachers ( often through fear ) to teach the subject. Students- especially biologically or pre-med inclined- start at a tremendous loss of information and understanding when they pursue further education.

1114. We live in 2018 not the middle ages ! If the superintendent doesn't want evolution mentioned let her move to Tennessee !

Respectfully,

John Barthelme  
Sierra Vista, AZ

1115. The standards would be significantly improved if the key concepts column were eliminated.

1116. The Arizona State Board of Education should NOT adopt the Science Standards until they have been modified to fully teach evolution and the Big Band.

1117. Divorcing evolution from it's results and processes is detrimental to the education of Arizona children, and society as a whole. The fact this draft even made it to public comment is an embarrassment and makes me ashamed of my state.

1118. I strongly disagree with the ADE's adding "key concepts". When districts create their curriculum maps based on standards, that is when key concepts and academic vocabulary should be addressed – not in a standards document. Also in professional development; district-wide & statewide by the ADE, & in resources: statewide and national.

1119. While the development committees provided a strong first draft for consideration, the process was severely compromised by additions/changes made by Superintendent D. Douglas. The AZ State Board of Education should NOT adopt these standards as presented. There are serious misconceptions about evolution that need to be removed.

1120. As a scientist (M.S., Chemistry) and National Board Certified Teacher (Adolescent/Young Adult Science), I cannot urge the State Board of Education strongly enough to reject the proposed draft.

The draft is not accurate: it conflates scientific theories with the common use of the word "theory", it confuses cause and effect, and presents a blatantly politically driven ideology.

The draft is not conservative: when combined with the Superintendent's publicly available comments, it invites a lawsuit from the ACLU, Center for Science Education, Americans United, and a host of other groups: a lawsuit which has strong precedent \*against\* the position our state would take. Why waste taxpayer money defending these standards in a suit we would lose?

The draft is not scientific or educationally sound: Major scientific and educational organizations have, to the last, rejected these changes.

The draft changes are disingenuous: As documented thoroughly by outlets like Ars Technica and the

- Arizona Republic, changes were introduced after experts weighed in, and those changes ignored their findings.
- I know that in biology and earth science, cosmology is not always address in depth. When cosmology is address, there are are still a lot of blanks. The question of a first cause is left out since that is not science, The problem with biology and earth science is that the dogma of evolution naturally leads students away from asking the first cause question. If we are truly trying to teach critical thinking, if we are trying to teach "free" thinking. Why not soften the dogma of current curriculum to allow for
1121. some thinking outside the dogma of evolution? What are we afraid of? There are a significant number of scientists (according to my research....not the least of which were many of the founding fathers of modern science, the believed in a metaphysical first cause. Students have a right to know these things....unless we are more interested in indoctrination than free thinking. So.....soften the dogma of evolution as the proposed changes suggest....and don't be afraid that our kids are going to turn into religions raving lunatics.
- Evolution should not be presented as a theory. It is a fundamental foundation of science and
1122. presenting as theory undermines the education of our children. The proposed changes are not about improving the education of our children but about inserting religious bias.
1123. Maintain the a separation of church and state in our public schools.
1124. It will further enamor our state in embarrassment to allow these standards and make a complete mockery of the separation of church and state ideal.
1125. No because it does not represent the true nature of science as stated in the draft.
1126. No!
1127. The courts have found that Intelligent Design isn't a scientific theory. Therefore, it doesn't belong in the science classroom. Including it in the curriculum is a waste of everyone's time.
- We need to retain references to and explanation of evolution. Evolution does not deny the existence of God. It is an observable fact. Just look at the bacterial adaptation to antibiotics, which requires us
1128. to use stronger and stronger antibiotics. Even the Big Bang required a Higher Power to initiate it. Arizona students deserve to be on an equal footing with students in the rest of the U.S. Evolution is an important factor in our understanding of the world.
- Removing evolution from curriculum is an extreme political decision rather than a sound educational one. These standards drive the instruction in our public schools where there is a distinct separation of church and state. There is an overwhelming support of the theory of evolution in the scientific community and there is an overwhelming critique of this theory in some religious communities. Such a decision to remove the theory of evolution from curriculum in our public schools is an assertion of
1129. religious belief that ultimately is unconstitutional and infringes on the rights of those who do not hold the same religious beliefs. There is no reason why multiple theories cannot be addressed. Creationism fits perfectly in Western Civilization Social Studies courses as it is comes from an essential text, The Bible, that greatly influenced the development of the Western Hemisphere. There is no reason both theories cannot be learned together. Learning both theories from these different disciplines helps develop well-rounded, well-educated citizens for our state.
1130. Evolution is NOT a "theory" - it's a proven scientific process and should be taught as such in all grades.
- The standards need to be revised to eliminate the inclusion of Intelligent Design and reinstate
1131. standards based on the theory of evolution so that our students receive a fact-based education in science that prepares them for STEM careers they will go on to pursue.
1132. Changing the words to something other than evolution is right out of George Orwell's book 1984. I think he called it newspeak. Bad idea!
- As noted above, the Science Standards as written prior to the internal review changes meet a much
1133. higher standard of depth of content and rigor. The draft as released in March, 2018 should NOT be adopted.
1134. More revisions need to be made to the wording.
1135. I absolutely cannot wait to vote in November and get people in office who have the best interests of Arizona's children in mind.
- There are very odd word and grammar changes and choices, such as using between when it should read among, or better yet, not to edit the text at all. Eliminating the word evolution for other words such as biological diversity is just incorrect. I sense that there is a malevolent intent here to use the
1136. science standards for public school children in Arizona to serve someone's agenda. That stinks, because we have to educate these children to be the adults who are going to have to solve our future problems with science, not political or religious ideology.

1137. The changes appear to be to introduce alternatives to the teaching of evolution by denigrating it as 'just a theory' though Einstein's THEORY of relativity, which is used in every GPS device from your cell phone to your car relies on that THEORY!  
THE RECENT CHANGES TO THIS DRAFT SCIENCE STANDARDS ARE INIQUITOUS. They are CLEARLY an attempt by a few sad individuals to impose RELIGIOUS belief systems upon the teaching of science. Of particular ODIUM are the changes that attempt to denigrate and cast doubt on evolution, the incredibly verified scientific principles of changes in organisms over time. Nearly as odious is are the attempts to denigrate the veracity of thousands of impartial, peer reviewed research publications which demonstrate the CLEAR AND PRESENT DANGER to all the citizens of this world...SOON. What is wrong with the individual who makes changes to these standards by changing the standards for
1138. teaching of how the earth rotates and revolves about the suns to imply Biblical concepts of FLAT EARTH. (Look closely, you will find these flat earth changes.) How can we tolerate in our "Science Standards" the numerous changes which try to cast doubt on the veracity and truth of SCIENCE ITSELF. These changes are almost universally horse manure; they reflect an extremely poor understanding of science itself, its contemporary truths, and most of all ARE AN ATTEMPT TO IMPOSE unsubstantiated and DEMONSTRABLY WRONG, RELIGIOUS PRECEPTS on our secular society. It is mandatory that these poorly thought out changes with clear religious bias, not science being taught, are fully removed from the original Science Standards Document!  
I'm for adoption with the concepts I outlined above.
1139. The concept of fact, theory, hypothesis and conjecture.  
Einstein's work with simplified thought experiments would be great for K-12 kids.
1140. The DRAFT needs one major revision regarding--see #15. Otherwise it is well written and comprehensive.
1141. This "science" standard is deeply flawed and deprives students of their right to receive an objective, unbiased education, free from indoctrination. It must not be adopted!  
There is obvious hard work that has gone into the extensive revisions to the science standards. It has been more readable, includes helpful flow charts and diagrams, and seems to be a much clearer
1142. version that the previous.  
By simply eliminating any changes to the evolution language, I would then be able to support this new draft.
1143. Elimination of distinction that organism diversity is a result of evolution is unacceptable.  
Please remove Diane Douglas' changes that discounts and undermines the teaching of evolution.
1144. Without evolution we won't have credible reasons for all the rest of science. Even the universe is evolving. AP Biology, which is a college and national curriculum, includes a major section of evolution.
1145. Previous standard was better.
1146. I support Superintendent Douglas' views.
1147. Please put back in the language and content surrounding evolution. It disadvantages our children to deprive them of academic learning and scientific fact.
1148. The study of evolution (along with the word "evolution") belongs in science education. Leave it there.  
No it should, it is a backward step, this issue was settled in 1927 at the "monkey trial" you are doing a end run on that, this nothing more than a attempt to do an end run around accepted science, it is a retrogressive step, It will harm students and deny them a opportunity to compete with their peers
1149. world, it is nothing but than religious bigotry, and impose religious beliefs on those who do not believe in her interpretation of religion. considering the great advances genetics ( does not understand the word genetics) our students will be short changed, this whole notion is absurd, set Az Back.
1150. Religion has no place in the classroom that is why we have a separation of church and state.
1151. Adopt these, instead: <https://www.nextgenscience.org/>  
Why use the language of "are believed" for evolution? That language is not used next to anywhere else in the draft. That's poor writing and suggests we need to think about evolution as different from other major theories. Share the information and the supporting evidence. We want our students to be independent thinkers for ALL topics - not just evolution.
- 1152.
1153. YES! These Standards are a great improvement over the 2004 Standards.
1154. Do not adopt the Draft!!!!  
I recommend the NGSS
1155. Do not exclude "evoluion" from the science curriculum! The evidence for the workings of evolution are overwhelming. Any student who graduates without a knowledge of evolution will be at a disadvantage

- in the work force. Our state education system will continue to lose credibility if students don't know what evolution means and how it works.
1156. Strongly disagree with the revisions the Board made to the original draft, pertaining to Evolution and origination theory. Religious dogma has no place in science curriculum. Reference to religious belongs in Philosophy not Science.
1157. Evolution is accepted scientific fact, as determined by serious, reputable scientists. Creationism or intelligent design is theology and has no place in a science curriculum. Our underfunded schools already put our students at a disadvantage in competition for college and jobs. Don't make it worse teaching falsehoods.
1158. No do not change the standards.
1159. I believe the Arizona State Board of Education should adopt this Draft for now, but also allow science teachers to use their autonomy to design their units based on this available document, but still be able to use other state's materials in their planning phase of instruction.
1160. The Board should not yet adopt this draft of standards.
1161. The internal review AZ standards on page 69 reads, HS.E2U2.17 Analyze, interpret, and critique \*supporting evidence for the Big Bang theory and the scale of the Universe\* theories related to the scale and expansion of the universe with every word between the asterisk deleted. However, on page 79 it reads, "L4: The theory of evolution seeks to make clear the unity and diversity of organisms, living and extinct, is the result of evolution organisms. The theory of evolution seeks to make clear...is included. Why are you leaving out the theory of evolution on page 62?"
1162. The word evolution should not be replaced by watered down language. It is a well established and proven theory and should be noted as such.
1163. Does not need any non scientific hypothesis such as creationism
1164. Earth and space sciences should not be required in high school.
1165. The Board of Education should rely on experts teaching in STEM fields to produce the standards. An elected superintendent without scientific background should not be permitted to dilute, diffuse, or confuse curriculum and standards.
1166. The only revisions needed to the standards originally submitted were to correct any spelling and grammatical errors .
1167. This is not educatio, it is religious gobbledygook and I will not give my money to such nonsense.
1168. The Next Generation Science Standards should be implemented. While they are not "perfect", they do engage students in deeper scientific learning and challenge them to develop and demonstrate deeper scientific literacy. It's one thing to create "Arizona based standards". However, the way these standards are phrased and also the removal of evolution and "The Big Bang Theory" makes Arizona's science instruction look ineffective.
1169. One hundred people qualified to address the state standards deliberated over the course of a year to arrive at the best approach to Arizona kids' science literacy. Then, it seems zealous ideologues came in and trampled all over the results because their friends could buy them the ability to do so. That's unacceptable.
1170. This draft of Arizona's Science Standards should not be adopted. Its explanation of biological evolution is inaccurate and does not reflect scientists' understanding of the natural world. Adopting this draft would do our students a disservice and make them less competitive for the important science jobs of the future.
1171. Remove the Douglas edits and I think it is great and should be adopted. But I do not accept this thinly veiled religious fundamentalists attempt to undermine science education with her lovely but non-scientific faith claims. She is not qualified to override the committee. She has her job - and it's not to undermine science education for her.
1172. Take out equivocation words.
1173. No they should leave things alone. There are bigger issues they should be spending their time on.
1174. By omitting the references to evolution you are disregarding a major facet of science, which means that children are not receiving a full science education. You can have discussions about evolution and its relationship with religion in religion classes, as many parochial schools now do. By disregarding the term, you are robbing children of part of their scientific education and making Arizona the laughing stock of the country.
1175. NO

1176. STOP FEARING THE WORD "EVOLUTION"
1177. Do not adopted the changes proposed in the draft.
1178. DO NOT ADOPT the DRAFT of the Arizona Science Standards! Evolution should be taught in the public school system and creationism/intelligent design has NO business in the science curriculum; it is not even a theory in science! Religion should be taught in religious organizations and not in public schools in the science curriculum.
1179. Too many changes have been made internally.
1180. See above.
1181. I do not believe that any standard that waivers from evolution should never be taught in a public school.
1182. The treatment of evolution goes against science. I rely upon scientists for my understanding of evolution NOT Superintendent Diane Douglas.
1183. It is imperative that students learn about evolution as the foundation of multiple disciplines of science. Students need an understanding of the scientific method and the most up to date research and scientific understanding. Watering down standards to remove references to evolution and the Big Bang theory would be a grave disservice to our students.
1184. Adopt NGSS!
- You cannot get rid of evolution or the big bang theory. Those are scientific knowns. I understand that it might conflict with some people's religious views- but heck so is letting women vote or be seen in public and we still rightly let women vote in Arizona and be seen in public. Being religious does not mean that you can not be scientific, too. If there is a god that can create a universe in 7 days, then
1185. that same god can create the awesomeness of scientific principals to govern that universe he/she created. Why does religion and science so often have to be mutually exclusive? Evolution is a known scientific fact. We have tremendous amounts of evidence. Don't have Arizona be on the wrong side of science. We are already so low in all of the other rankings. Please don't require us be the state where educators ignore scientific evidence. Let us be on the right side of this one.
1186. We cannot let Diane Douglas change curriculum based on her own personal beliefs.
1187. It should absolutely NOT adopt it. It would be reckless and backward.
1188. God isn't real
1189. I am very opposed to removing references to evolution. I understand it as a movement away from proven science and an effort to blend religious beliefs with science. Please remove this!
- I have great concern that students' science education is being watered down by avoiding in-depth study of the scientific method and the foundations of virtually all scientific disciplines, including
1190. evolution and the big bang theory. Our students need instruction on complex concepts, data analysis, and rigorous scientific thinking. Leave analysis of societal development and comparative systems to the study of literature and social science.
1191. I believe the SBOE should consider the original work of the committee's original draft rather than the draft created by the internal review process.
- Please, do NOT adopt this new draft. We are not serving our children if we do not teach them about
1192. valid theories and fundamentals of science. To have one zealot of a woman restrict what our children can and can not be taught due to her personal beliefs is totally unacceptable!
1193. Once the issues of evolution and climate change are more adequately addressed, these will be vastly improved compared with the currents standards.
1194. This draft should not be adopted.
1195. Stick with scientific fact, not religious belief.
1196. Not with all the subterfuge of embedded mumbling/ denying about evolution and the origins of the universe.
1197. If the teachers can't understand the standards as written, how are we supposed to teach them?
1198. Public schools may not promote any faith or religion based view of science. To do so is a violation of the First Amendment, and as such, a violation of the law.
1199. more new generation science standards needed
1200. This draft needs intensive revision. The standards are not well aligned with the Framework. They are



- not aligned to the NGSS for which Arizona was a lead state. Creating standards that do not align to NGSS and the Framework ultimately means that districts will be scrambling to either try to find and purchase curricula to match these standards (While most quality curricula will be aligned to NGSS and/or the Framework) or will have to pay teachers to develop curricula to align to these standards. These are not good uses of district resources, nor will they result in quality materials. We need to ensure Arizona students will be on par with the rest of the country in terms of what they are learning (and how they are learning it) in science, technology and engineering. We are doing them a disservice if we do not prepare them adequately for college and careers.
1201. Superintendent Douglas's statements about intelligent design, rejecting the use of evolution and big bang make modifications during her administration suspect.
- I see this draft as a huge step backwards, and am concerned that my child and other AZ Public
1202. Education students would be lacking in a thorough understanding of scientific facts. I am further concerned about what teaching materials would be used as well. This is frightening to me.
- They should not, and to do so would be a clear violation of the separation of church and state due to
1203. the unwarranted attempt to remove the word evolution. Evolution is not a concept that is debatable, it has been shown and proven to be factual through numerous studies and research.
1204. Should NOT be adopted with any of the religious concepts such as creationism or divine intervention.
- You should NOT adopt the draft. It was tampered with after experts did the work of updating, and the tampering was done to water down true scientific concepts in order to introduce faith-based material.
1205. Science is NOT faith. Science is the concrete study of our world via research, exploration, and the scientific method. To adopt the standards as proposed is a disservice to the students and to the educators who actually understand the concepts, as opposed to the lack of knowledge of the Superintendent of Instruction.
- Accepting the Standards as currently proposed would undoubtedly initiate legal-actions that ALL
1206. taxpayers of the State of Arizona [ of whatever religious tradition, or none ] would be involuntarily forced to subsidize. NO TAXATION WITHOUT REPRESENTATION !
1207. This is a travesty. Fix it.
1208. No. We need more NGSS language.
- AZ BOE should not adopt the proposed science standards.
- EVOLUTION- it means change so do not mislead students on "biological diversity." That is an outcome OF evolution, not the process itself. The scientific community overwhelmingly supports evolution and the state superintendent, who does is not certified to teach in the state of Arizona, has no place editing science standards.
1209. MAGNETIC CURRENT- does not exist. Force or field is an accurate term.
- Again, our State Superintendent has never taught in a classroom, let alone delivered science instruction. The standards, drafted by actual science teachers and experts in their field, were excellent as they were and did not merit any revisions made by an individual who is not highly qualified to teach the subject.
- Do not dilute our children's education with notions of doubt regarding evolution. The USA already suffers greatly on the international frontier from a lack of rigor and truth in science education, and
1210. Arizona in particular has been especially irresponsible to providing quality education compared to the rest of the nation.
1211. Do not adopt.
- I am embarrassed for the leader of our education department, Diane Douglas to try and water down core scientific standards by diluting language around evolution.
- Evolution is a scientific principle proven over and over again with empirical evidence (see antibiotic
1212. resistant bacteria and round up resistant plant life) and should stay in the science curriculum. Intelligent design or other beliefs or philosophies of origins of life should stay in the realm of beliefs and philosophy as part of a philosophy or religious studies curriculum and should not be in the scientific realm as they are beliefs and cannot withstand the rigors of scientific methods of discovery.
1213. Evolution needs to be taught.
1214. Does not use meaningful and standard scientific language in covering Evolution
- Science standards should be based on proven scientific discoveries and not creationism or intelligent
1215. design or any of the religious/faith based theories. Religious and faith based studies should be conducted in the private realm of religious institutions.
1216. I cannot support Diane Douglas's efforts to weaken science in her effort to teach religious notions as science.

1217. As the draft stands now, I do not support its adoption. The edits made during the internal review process should be eliminated, as they were intrusive and inaccurate. Any changes ADE thinks should be part of the science standards should go back to the working committee. We can do better as a state than adopting this draft!
1218. In general I think the deleted wording in the "DRAFT Released XXXX DRAFT" is generally to be preferred.  
This draft is unacceptable. DO NOT remove The Big Bang and evolution from our science curriculum!
1219. Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!  
Quit trying to modify "evolution" in the standards to make it "the theory of evolution".
1220. These are Science Standards. Evolution is science.  
Creationism and "Intelligent Design" are stories for Sunday School. These stories don't belong in the AZ Science Standards.
1221. The Superintendent of Public Instruction should be ashamed.
1222. Religion in Science class doesn't mix. Please teach science .
1223. Elimination of the use of the word evolution and discussion of the big bang are giant steps backward in a state desperately in need of improvement in K-12 education.  
NO. Elimination of vocabulary and discussion of evolution negates any value this plan could have had.
1224. I am embarrassed for the people who put this together but would really like to find a way to rid the state of the "educators" who edited the original draft.
1225. My comments in items 9, 11, 13, and 15 reflect the areas that need major revisions before these standards could be ready for adoption.
1226. Need to keep evolution. All concepts deleted by demented Superintendent need to be replaced.  
I cannot endorse any curriculum with religious content. Intelligent design and evolution can co exist,
1227. but intelligent should be taught at home and left to parents to explain their family's belief system to their children.  
Were I king, I would remove instruction on Space "Science." While there are some things we can observe in Astronomy, the conclusions from those observations are not necessarily scientific.
1228. Also, as above, I can see the groundwork for teaching our children about "Global Warming" in the curricula. So I would remove any reference to "climate" under Earth Science.
1229. I do not recommend these standards over the old 2004 state standards.
1230. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
1231. These standards should NOT be adopted as is. Arizona science standards should focus on science, not theology.
1232. NO! Separation of church and state! Did we forget about this basic rule?
1233. The attempt to take evolution out of the standards is indefensible. Leave evolution in the standards, and the big bang.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
1234. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.  
The Arizona State Board of Education should at minimum undo the language changes which remove
1235. the word "evolution" and replace it with "biological diversity". A better option would be to adopt the NGSS.
1236. In the strongest possible terms, I oppose such an adoption. It would be a substantial setback for any hopes of progress in this state, nation, and world.  
I am actually somewhat torn on this answer. I did not thing anything was wrong with our second
1237. grade standards. The new ones look fine as long as they don't take away anything we are currently doing. My students love their Science!
1238. The draft as written weakens standards needed to understand the scope and detail of scientific theory.

1239. Absolutely not without the putting the theory of evolution back into the standards. We do our children and their future no favors with this strange indoctrination.
1240. The ax state board needs to understand th US Constitution j
1241. The State Board of Education needs a lesson in constitutional law. Do not teach religion in science classes. Unconstitutional!  
ID is not science. Teach science in schools. Teach religion at church. If you want to learn about ID
1242. exclusively, go to a religious school. This is exactly why students are being funneled out of our public schools to questionable charters that are leeching money away from our teachers.
1243. We must teach evolution as the prevalent model for life on earth, unless it is disproved by rigorous scientific examination.
1244. Teach evolution. Teach "Big Bang."
1245. Items need to be revised, and consideration of the amount of curriculum in science revisited.  
The omission of evolutionary theory is a huge disservice to our children. Evolution is a scientific theory that is based on critical, in depth research with evidence to its validity. It is as near to fact as
1246. one can get. Arizona children will be left behind, again, if they are not given the opportunity to learn about evolution. They will have deficits in their knowledge that will put them at a disadvantage in regards to the students in other states and across the globe. It is definitely NOT ok to leave it out.  
Those who challenge the basis for the acceptance of evolution may challenge it - NOT censor it. Religious believers who cannot reconcile scientific theory with their belief systems should not have the right to control or eliminate free speech in the public arena (e.g. public schools). This is an un-American violation of the separation of Church and State that our founding fathers wisely put in place
1247. which protects BOTH the believer and the nonbeliever and allows for public discourse and open disagreement in civil fashion. Eliminating the use of any scientifically derived term in the standards is the equivalent of the state dis-allowing the use of the word "God" in places of worship and religious discussions, insisting instead that euphemisms like "Higher Power" or "Divine Spirit" be used instead - no religious person would stand for this, nor should they. Civil debate disagreement should never be about censorship.  
See above comments.
1248. Please don't make our Arizona's education even more of a detriment and laughingstock than it already is, Ms. Douglas.  
See my comments above in no. 15. This draft should NOT be adopted. It is clearly a politically
1249. motivated attempt to influence and degrade scientific education in Arizona. What is particularly sad about it is that it will have a negative effect on Arizona's children and their ability to be educated and well-positioned in the 21st century.
1250. No it should not adopt. Arizona should seek to place its students at the top of STEM competency. not add language that science teachers would not adopt.
1251. This DRAFT should have been designed and vetted by scientists not by Diane Douglas who has no science training.  
It's a terrible idea to skew the science curriculum based on ideology. The science of evolution, cosmology, and so forth are well established. There will always be new discoveries (that's science!),
1252. but a lack of perfect knowledge should not be used as a pretext for depriving our children of a quality science education.
1253. We should not be taking evolution or any other scientific facts out of education.
1254. Extensive revisions need to be made to the introduction, standards and connections to other academic disciplines sections of the draft.  
Arizona's State Board of Education should NOT adopt this DRAFT as Arizona's Science Standards. It is
1255. important and critical to scientific fields to understand the theory of evolution and separation of church and state. Not everyone is religious and goes to church. I will choose to homeschool my children if such a standard is adopted.
1256. I do not think creationism has a place in our science standards and these new standards to be amended to remove any mention of this and then they would be fine.  
I am the parent of a public school third-grader. I am vehemently opposed to any removal of
1257. evolutionary teaching in our public schools science curriculum. There is no fact-based evidence to support any other theory, and any so called "atomic biology" is merely religious belief masquerading as science.
1258. Do not draft this standards plan!!!
1259. No, Arizona's State Board of Education should NOT adopt this DRAFT as Arizona's Science Standards.

1260. Religious beliefs have no place in science standards. DO NOT remove references to evolution and replace facts with religious terms. We are already falling behind the rest of the world.
1261. Evolution should NOT be removed
1262. Teach science
- The AZ Sate Board of Education should NOT adopt the "Draft with Internal Review AZ Science
1263. Standards." There appear to be many instances in which the Big Bang Theory has been removed, as has been language or reference to the Theory of Evolution has been removed.
- Please do not take out learning of evolution. As a teacher, parent, as well as a Christian, I believe
1264. science needs to be taught in conjunction with what science shows. Parents are able to do their job and teach religious beliefs within their homes according to their belief systems.
- I hope that more communication and collaboration will take place between higher ed science FACULTY in Arizona and ADE regarding these standards. As opposed to Administrators from universities outside
1265. of the state. More High Schools are offering Dual Enrollment college credit science classes and these new science standards should reflect a coordination with curriculum so that students are not left with GAPS in their science preparation.
- To whom it may concern,
- As an infectious disease doctor, my patients' lives and limbs depend on my science knowledge. Protecting our country from biological warfare attacks, disease outbreaks, foodborne illness, diseases affecting our crops and natural disasters will be difficult or impossible without a science-educated workforce.
- I feel that it is very important for our students to learn basic science, including facts about evolution, gene technology, global warming and vaccines without interference from religious extremists or
1266. science deniers.
- Watering down science curriculum with religious nonsense does a disservice to our society, making our country less competitive with more reasonable nations, and less safe.
- Sincerely,
- Steven Oscherwitz MD  
Infectious Disease  
Tucson, Arizona
- The Draft still needs to be revised to include all theories on origin of life. There are plenty of
1267. educational materials available to show how the scientific process and observable evidence is used to support creation and that should be included along with the teaching of evolution in public schools.
1268. I feel that we should adopt the NGSS
- There is too much ambiguity in the various standards. Adding words like "may or believed to result" creates doubt in actual processes and removes the certainty that comes with repeated research,
1269. testing and evidence that is used to support these theories. Return to Core standards that include more details and concepts.
1270. GET RID OF THE NONSENSE ABOUT EVOLUTION BEING JUST A THEORY!! Science standards should not include religious leanings.
1271. Any science standard that obfuscates the significance of evolution is lacking.
1272. Put it back the way it was.
- No to changes made by Diane Douglas. As an elected official, she is obligated to represent the entire
1273. population and not impose her own religious views, especially when her job is to be the top educator in the state. In her position, putting personal ideology over science and education is abhorrent.
1274. Yes.
- No whatsoever! Bring the standards to meet the new advancements in KNOWLEDGE. You want to
1275. improve school scores? Then do do not begin with changing curriculum that has no basis is fact. Voters are watching.
1276. No, it should not. Again, I urge the state to adopt the Next Generation Science standards that the state participated in drafting. This is the way to go.
- Science needs to teach science, not "alternative facts." That's what Sunday school is for. Keep religion out of schools. Nobody needs it it's all just brain washed BS. Big technology companies won't flock to
1277. AZ if people don't want to send their kids to our poor ranking schools. Teaching alternatives to evolution makes us look stupid.

- I would like to see the key concepts/vocabulary column removed. At the beginning of each section, it states that these are not intended to be a maximum or a minimum, but by listing them in the standards, it is assumed that these are a minimum (especially since the column header states "key concepts include, but should not be limited to". It does not say "may" include!
- 1278.
- There are some places that need modifications. There is a lot of information within that probably is not needed. The plus standards are nice for advanced classes but could make things more complicated.
- 1279.
- This is a decent draft--(from the life science prospective) however, the above revisions or suggestions should be taken into account because these could be intimidating for teachers new to the state or new to the profession, as well as, the order needs to make sense. If you can create a set of standards that go in the order in which the content should be taught, then let's do it, causing less confusion among students, teachers, schools, districts and ultimately the state. AREN'T WE SUPPOSED TO BE WORKING TOGETHER??
- 1280.
1281. yes
- Biggest thing for me would be the order of which the concepts are taught. It would be nice to see a different order that makes more sense for the students understanding, jumping around makes it difficult for them to retain the information. So maybe arrange the standards in a different order would help....I know you noted that the standards are not in the teaching sequence but I think it would be beneficial to put them in that order in which you want us to teach them.
- 1282.
- I do not want the Board to adopt any draft that teaches creationism. We have freedom of religion to practice the faith of our choosing. Publicly funded schools should teach science based in science. It's imperative to educate our kids properly so that they can go onto higher education and compete well in science related fields. AZ Constitution does not allow publicly funded religious education. ESAs have deceptively bypassed that standard in bad faith. Please do not follow suit. Thank you!
- 1283.
- I would favor the adoption of the Next Generation Science Standards which are already aligned to Cross-Cutting concepts, Engineering Principles, and include lesson planning and developing materials through organizations like the National Association for Teachers of Science. I'd also like to see a more robust set of cross curricular connections to English/Language Arts. There are many standards in addition to Reading Informational text that would merit mentioning in this text. I think this draft needs moderate revisions, but, I do not agree that I support it until those modifications are made. I find the choices in number 16 problematic.
- 1284.
- Like I said above the following standards: 1.L3U2.9, 1.L4U2.10, and 1.L4U4.11 are NOT DEVELOPMENTALLY APPROPRIATE for 1st grade. Standard 9 is basically about teaching students genetics which I didn't learn until high school. Standard 10 is about dividing animals into groups based on the classification of invertebrates and vertebrates. Again, I did not learn this until middle school. Standard 11 is learning about extinction and how humans can effect that. Again, that shouldn't be learned until high school when students can process the material. They need to be learning the basics. You are going to have teachers who won't be teaching science because of these ridiculous standards. You don't want that. You want students learning science and you want teachers teaching it. With the current draft you will have teachers doing the opposite of what you want. Please change these.
- 1285.
- Several of the standards are either vague and/or confusing as written. It is going to be hard to be sure that we adequately address the standards. Some of them are so broad that they are unattainable.
- 1286.
- This draft needs significant revisions in the following areas:
- 1.L3U2.9 this is more for high school students not first grade.
1287. 1L2U1.8 What does it mean by 'obtaining resources through body systems'??
- 1.L4U2.10 is a middle school concept (vertebrates and invertebrates)
1288. Please get the Standards in an objective form rather than a vocabulary list that was previously deleted.
1289. Yes this draft should be adopted.
1290. Do not adopt this draft keep evolution fire this lying woman
- Evolution as science is vital to include in the curriculum, along with creationism. Eliminating evolution deprives Arizona students of a state of the art education and casts Arizona in a seriously ignorant light.
- 1291.
- Thank you to those who worked hard to make the standards as good as they are.
1292. No Creation myths. I am a devout Christian and want only scientific facts, no Sunday School in schools.



1293. Do we want our students to be able to compete in the modern world or just in their church circles?  
The theory of evolution should not be presented as a fact and without at least some of the thousands of arguments and evidences against it. The student study guide, "The Icons of Evolution" should be adopted as part of the biology course standards and should be a required part of the course. It shows
1294. some of the scientific problems with the 7 most commonly used evidences used in support of evolution in the textbooks so students understand that it is a scientific controversy rather than a proven scientific fact  
You can get it from the Discovery Institute (206)292-0401.
1295. It's much better than what we have.
1296. The board must adapt the ORIGINAL standards issued by the science professional working groups. DO NOT adapt the standards revised by Douglas.  
N.B. I 'Strongly Disagree' because the attempt to "hide" evolution as the prime mover in biology is profoundly un-American. Diane Douglas believes she can insert her own religious beliefs into a science curriculum that should be rational & "scientific" undoubtely to open the door to 'intelligent' design. Her religious beliefs should not TRUMP the scientific findings of >97% of the scientific community.  
In addition, it makes AZ look like just another backwards Southern state, it will discourage hi-tech companies from moving here, & strongly reminds me of why Russia fell behind in biology (Lysenko, Stalin's director of biology, chose Lamarckian evolution, not Darwinian, because politics, not science, demanded it).  
Also choosing not to even mention the Big Bang theory as the best explanation of the evolution of the universe is another pitiful concession to the Flat Earth society.
1297. We can keep AZ at or near the bottom of the list of states that actually support an education for the modern world & we can put it at the top of the list of states whose right-wing politicians use religion as a tool that can manipulate citizens to do and be what the politicians want them to be - ignorant 'fraidy cats' who will accept their servitude while being told they made America great again (for autocrats, kleptocrats, fascists, corporations, etc.).  
BTW, the statement 'the knowledge produced by science is used in engineering and technologies to create products' as opposed to saying 'to serve human ends' is pitiful. Are you trying to create consumers or citizens? The knowledge produced by science can also be used in engineering and technologies to create art, bridges, monuments, cities and may even be necessary to save the human race from the damage that capitalism has done to the world in order to create "products".
1298. I support the adoption of the Next Generation Science Standards, that Arizona participated in and has the support of scientists and science teachers across the nation.
1299. No, it is still skimming the top of concepts with no time for depth. Why not adopt the NGSS?  
This document needs MUCH more work. Compare to what we have, NGSS, and other states...this is
1300. much too vague and has too many holes - chemistry, periodic table, astronomy, rock cycle
1301. We need to look more in depth at these standards they are confusing, they don't flow well. Certain items especially in the physical science I do not feel that 6th graders are conceptually ready for it.
1302. N/A
1303. These standards need to go back to scientists and educators and be kept out of the hands of non-scientists who do not understand the mistakes they are making in their editing.
1304. Of course not. Science brings us information so that we can improve ourselves as well as our planet. Science allows exploration. Intelligent design shuts the door on learning
1305. Removing the language of evolution from science teaching does not serve students well.
1306. REJECT
1307. I am currently doing biological research as I pursue an advance degree in a biology-related field. Unlike many others at the university, I support the proposed changes to the science standards. My reasons are as follows:  
1. The language change may prevent misunderstandings. The word "evolution" can be used to describe many processes which involve change over time to allow a reproductive benefit to organisms. As such is used to describe changes in cell types, micro-adaptation characteristics of a species, or macro-changes leading to one species changing to another. Most individuals accept the first two, even when they do not believe that these micro-evolutionary changes lead to species

differentiation. As such, when the word "evolution" is used, many people don't want to listen to the context because they expect it to be about species differentiation, which is a much rarer use of the term in academic settings.

2. These changes may lead to less religious objection to kids being taught science. If the term "evolution" is not required to be used in classrooms, it may reduce fear that the science classroom will be used to push an anti-religious agenda.

3. As such, it may help keep kids in the public schools, particularly students from religiously conservative households. If we need to keep our kids competitive via regulating classroom curricula, then we also need to keep kids in classrooms where regulated curricula is being taught. Kids who are sent to private schools or who are homeschooled are not subject to the same standards, and this is a common alternative used by parents who disagree with public school curricula.

4. And it's not just the parents who object to students being taught macro-evolution: it's the kids as well. I grew up in a religiously conservative church, and in Sunday School we were regularly told that our school teachers would try to teach that we came to be "from goo to you by way of the zoo" but that we should stand firm to our belief in God. Although my parents didn't reinforce this, I was prepared to push back when my teachers inevitably insisted that evolution was correct (they didn't). Because of this expectation, I closed my mind and wasn't interested in learning biology in high school. If removing teaching the word "evolution" from the standards will help combat this unnecessary fear-mongering and will lead to more student being open to being excited about learning science, it would have a better chance at raising our students' understanding of science and leading to them believing scientific evidence later in life.

5. Using the term "evolution" is absolutely not necessary for teaching science. My high school teachers (in Arizona. Though the standards may have been different back then) never mentioned the word in two years of biology. In college I didn't get into a class on evolution until my senior year in college, despite majoring in the sciences. The concepts of micro-evolution can be taught without the use of the word "evolution". Macro-evolution should, in my opinion, be left to college students who are contemplating of the origins of life after already having been exposed to a wider range of views that are not purely based on their parents and home community.

6. Some people seem to be concerned that this will be used to teach evolution as "only a theory" or to teach intelligent design. This may have even been the personal motivation for the individuals who proposed making these changes, but the standards are not worded in such a way as to promote this. Even if it is possible, I think that it is unlikely due to a combination of the public school teachers own tendencies and pressure from the state, school, and parents.

If this ends up being a first step in order to teach intelligent design in the classroom, I will object to any later steps in that direction. However, I support these proposed changes to the science standards, and hope they will lead to a wider acceptance of science by our students and their parents.

(On a side note, I also feel that funding our public schools in a way that actually gives them more money would have a bigger benefit to our state's students than arguing over the wording of the educational standards)

1308. NO - Creation Science or Scientific Creationism MUST be eliminated from all public education.

1309. Very disappointed that Evolution and Big Bang theories are being dumbed down. This is not the direction a forward looking educational curriculum needs to be going.

1310. The Board of Education should not adopt this draft.

1311. I am currently doing biological research as I pursue an advance degree in a biology-related field. Unlike many others at the university, I support the proposed changes to the science standards. My reasons are as follows:

1. The language change may prevent misunderstandings. The word "evolution" can be used to describe many processes which involve change over time to allow a reproductive benefit to organisms. As such is used to describe changes in cell types, micro-adaptation characteristics of a species, or macro-changes leading to one species changing to another. Most individuals accept the first two, even when they do not believe that these micro-evolutionary changes lead to species differentiation. As such, when the word "evolution" is used, many people don't want to listen to the context because they expect it to be about species differentiation, which is a much rarer use of the term in academic settings.

2. These changes may lead to less religious objection to kids being taught science. If the term "evolution" is not required to be used in classrooms, it may reduce fear that the science classroom will be used to push an anti-religious agenda.

3. As such, it may help keep kids in the public schools, particularly students from religiously conservative households. If we need to keep our kids competitive via regulating classroom curricula, then we also need to keep kids in classrooms where regulated curricula is being taught. Kids who are sent to private schools or who are homeschooled are not subject to the same standards, and this is a common alternative used by parents who disagree with public school curricula.

4. And it's not just the parents who object to students being taught macro-evolution: it's the kids as

well. I grew up in a religiously conservative church, and in Sunday School we were regularly told that our school teachers would try to teach that we came to be "from goo to you by way of the zoo" but that we should stand firm to our belief in God. Although my parents didn't reinforce this, I was prepared to push back when my teachers inevitably insisted that evolution was correct (they didn't). Because of this expectation, I closed my mind and wasn't interested in learning biology in high school. If removing teaching the word "evolution" from the standards will help combat this unnecessary fear-mongering and will lead to more student being open to being excited about learning science, it would have a better chance at raising our students' understanding of science and leading to them believing scientific evidence later in life.

5. Using the term "evolution" is absolutely not necessary for teaching science. My high school teachers (in Arizona. Though the standards may have been different back then) never mentioned the word in two years of biology. In college I didn't get into a class on evolution until my senior year in college, despite majoring in the sciences. The concepts of micro-evolution can be taught without the use of the word "evolution". Macro-evolution should, in my opinion, be left to college students who are contemplating of the origins of life after already having been exposed to a wider range of views that are not purely based on their parents and home community.

6. Some people seem to be concerned that this will be used to teach evolution as "only a theory" or to teach intelligent design. This may have even been the personal motivation for the individuals who proposed making these changes, but the standards are not worded in such a way as to promote this. Even if it is possible, I think that it is unlikely due to a combination of the public school teachers own tendencies and pressure from the state, school, and parents.

If this ends up being a first step in order to teach intelligent design in the classroom, I will object to any later steps in that direction. However, I support these proposed changes to the science standards, and hope they will lead to a wider acceptance of science by our students and their parents.

(On a side note, I also feel that funding our public schools in a way that actually gives them more money would have a bigger benefit to our state's students than arguing over the wording of the educational standards)

**Total Respondents 1311**

**15.** The Introduction section provides enough information and context for me to understand how the standards are designed and intended to be implemented.

		<b>Response Total</b>	<b>Response Percent</b>
Strongly Agree		<b>123</b>	<b>12%</b>
Agree		<b>569</b>	<b>56%</b>
Disagree		<b>167</b>	<b>17%</b>
Strongly Disagree		<b>149</b>	<b>15%</b>
		<b>Total Respondents 1008</b>	<b>100%</b>

**16.** Please comment on the Introduction section.

1. Perfect
2. Lengthy.
3. It's written clearly.
4. I can understand it but I was on the committee and was specifically educated on the graphic and the rationale.
5. The time allocation is not fully reasonable in most classroom days-- Science and Social Studies need to be alternated or the 45 minute block needs to be split between them.
6. This is clear and communicates the ideas behind the cross cutting concepts, core ideas, science and engineering practices as well as the intention of the standards to not be the curriculum or instruction....MINUS the key concepts that were added during the internal review.
7. The introduction was understandable after a brief scan.
8. The background of the standards made sense.

9. Wording is a bit confusing
10. Do not understand the introductory explanation.  
More specific information and guidance should be given to help schools navigate how the transition into the new standards from grade to grade should be executed. There seems to be a great deal more spiraling throughout grade levels, which is an excellent strategy. However, we need specific guidance
11. on how to transition effectively so that students are not experiencing gaps. This also means that teachers need to be held accountable for teaching science in elementary grades, and not merely through the use of informational/expository text. Students must experience science through inquiry.
12. images are useful
13. It is even a bit long.
14. Add some more detail about how to age appropriately interpret standards.
15. Formerly known as the scientific method? What is with this wording?
16. The need for examples of crosscutting concepts should be moved to the Appendix.
17. The Introduction makes sense, however there is no consistency within the breadth of the standards that reflects the NGSS principles.
18. Not enough information to help suggest how or what steps build to teach the larger pictures.
19. This question seems misplaced/should be at the beginning.
20. As a new teacher, I'd prefer it to be more explicit in terms of what the standards are saying.
21. Introduction is fine.  
Cross-curricular implementation and possibilities should be emphasized in each content introduction if they will remain grouped by discipline area. Many of the essential standards can be taught in all
22. discipline areas and shouldn't be limited to one specific content area.  
additionally, Appendix 3 should be acknowledged or present here to make the big idea/main end goal clear to all what students will be assessed on.
23. Necessary to understand the coding, scope and sequence. It is very clearly explained.
24. The introduction provides a nice overview for all grade levels. Also giving an overview of Crosscutting Concepts, Science and Engineering Practices, and Core Ideas for K-12.  
although there is enough information and context to help me understand how the standards are
25. designed, it is hard to follow and additional graphics, such as tables, would help the organization and clarity of the introduction
26. The introduction is very informative and provides background information that is helpful.
27. Gave a brief description of what is expected throughout the 3 dimensions of scientific learning.
28. The introduction section gives a thorough description of the big ideas that are the basis for the new standards.  
Like that the science and engineering inquiry process is intergrated into a more cohesive well rounded
29. process instead of being linear. Like that the introduction clearly explains both the practices and sources of the core ideas.
30. I Like that the science and engineering inquiry process is integrated into a more cohesive process instead of being linear. Like that the introduction clearly explains both the practices and sources of the core ideas.
31. Quick overview. Nice to remind teachers of its structure. Not sure it is enough for teachers not familiar with the K-12 Framework.
32. Three dimensional teaching is the best, research way to go. The Framework for K-12 Science Education and the Working with the Big Ideas of Science Education was a smart decision. On page 2 however where there is information in green the introduction becomes muddy as there are incorrect science examples used. The statement "In Earth and space sciences, tectonic processes follow a pattern" is false. If it were true we would never be surprised by an earthquake. In science tectonic plate movement is taught not a tectonic PROCESS. The Science and Engineering practices were never the scientific method and even our 2004 standards don't allude to one way of doing science which is what the antiquated scientific method does.  
L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms. Should say The diversity of organisms, living and extinct, is the result of evolution. Based

on the documents in which the committee use to write the standards, Working with Big Ideas of Science Education, rewriting this statement makes it unclear and confusing.

33. Nature of Science is not included in the front matter. Would like to see a comment of reference to the appendix for explanations of what is included in each practice. Some may not have a clickable document when they are reviewing or making decisions about curriculum. On page 4, "Each standard is written at the intersection of two core ideas", I would like to see that it is at the intersection of three dimensions and reference the crosscutting concepts too.
34. It was very clear.
35. These are not what the committee created
36. Though the time expectation only addresses the number of minutes per week the standards should be taught and misses the more important number of weeks required to teach the specified information.
37. The introduction needs to include vocabulary for each standard Sub-Category (ex: Physical Science, Earth and Space), as well as explicit expectations for what expected of the student in each standard.
38. The introduction gave enough information to be able to understand the layout when I went to my grade level.
39. Throughout the document, the science and engineering practices are explained as being "formerly known as the scientific method," which is misleading. While the part of the old standards that most closely resembles the practices was the scientific method, they are not the same thing. The "scientific method" is a linear procedure devised by well-meaning teachers and does not resemble in any real way what scientists actually do. The "Science and Engineering Practices" are intended to be a comprehensive, non-linear outline of all of the roles and tasks a scientist must do. Without explanation of this key difference, there is a danger of teachers continuing to teach the "scientific method," which is contrary to the intent of the standards.
40. remove information about scientific method and paragraphs about patterns. Neither are correct or make sense.
41. The introduction does not provide any details on how this is to be implemented. It lists the basic ideas covered in each grade level.
42. In the Core Ideas for knowing science could L4 read something like "L4: The theory of evolution seeks to make clear the continuity, unity, and diversity of living and extinct organisms"? This will then encompass that evolution is a continual process that takes time but connects all species?
- Core Idea U3 for using science makes science seem very commercial.
43. No comment.
44. You now have material that used to be in 1st grade (human body) in third grade. If they can handle it in an earlier grade they should. Also there is repetition in things such as plants, which could be repeated learning or each grade level assuming the other person is teaching it.
45. On page 2 it states that tectonic processes follow a pattern. If this were true, why can't we predict an earthquake or tsunamis? INACCURATE!
46. Page 2 refers to predicting patterns of tectonic movement. While plates have predictable movement we cannot predict outcomes of their movement.
47. Although, much of the green verbiage needs to be revised or removed.
48. This portion looks fine to me.
49. Introduction  
Page 2  
In the first sentence, remove "between science disciplines" - this contradicts the next sentence, which is the correct interpretation of crosscutting concepts - it is not only within Science - but also between other disciplines.
- Page 3, 9, 21, 33, Appendix 2  
Remove "Formerly known as the scientific method" → this simply is not the case.
- Page 5  
Under the heading, "The standards are neither curriculum nor instructional practices" the statement "Therefore, identifying the sequence of instruction at each grade - what will be taught and for how long - requires concerted effort and attention at the local level." must be heeded by the State Board of Education and Arizona Department of Education. The local school district's will not have the time that is needed with the final standards to do the work that is described in this sentence. We need to begin teaching 3rd, 6th, and 9th grade students using the new standards in August 2018. We won't



have the final standards in our hands to identify 'the sequence of instruction at each grade' with enough time to give the task our 'concerted effort and attention'. This is not what we should be doing for our students. We will not be able to teach these standards with fidelity on the current timeline for these standards and the assessments that will accompany them.

50. Awesome except the poorly written example of patterns.
51. The introduction section seems comprehensive and good.
52. Should offer a greater clarification of the about the core ideas.
53. It was familiar enough but more specifics will be useful.
54. Our group felt that there was sufficient information in the introduction section.
55. It is clear.
56. That all grade levels need to be doing science about 60 minutes a day.
57. The introduction is easy to understand.
58. Fine.
59. The problem part is how they should be implemented because there is no building on different standards.
60. The introduction section lists the three dimensions and provides examples along with the goals of the new standards.
61. Too complicated!!
62. It is well written although shorten this section. Most teachers will skip over this section
63. It does not tell us how it will be implemented, it says it's up to the district.
64. It has a graph that is laid out nice and very easy to understand.
65. would like to see how the teachers are going to break it down to implement it into the classroom
66. If we keep these elements the introduction is good. But if we are making changes then the introduction needs to change.
67. Seems like it explains the expectations clearly.
68. If you keep this document the same, then the intro fits well.
69. It a lot of words it would be nice to simplify the facts.
70. It shows vertical articulation.
71. Fairly lengthy, but thorough.
72. While I appreciate the summary, it seems to be a lot of information.
73. **[No Answer Entered]**
74. The introduction focuses around the core ideas. The Science and Engineering Practices are much more rigorous than the Scientific Method and promote creative problem solving.
75. it focuses around the core ideas. the science and engineering aspect are much more vigorous than the scientific method.
76. Way to wordy.
77. I especially like the graphic used in the introduction. It is much better than the NGSS.
78. Overall, the introduction provides enough information and context to understand the standards. I'm confused by the ADE changes that were made. The example for Patterns doesn't really capture the intent of that practice. I recommend that if an example is included, the ADE allow the working groups of educators to write a better example or to pull one from the Framework, as several examples are cited in that document. I am also confused about the statement about the scientific method, this indicates that there isn't a clear understanding of the practices (even the 2004 standards didn't refer to the scientific method) Please consult with high education faculty or research documents such as

- the Framework to better understand why the reference to the scientific method is misleading and inappropriate.
- It looks like it is subtly pushing anthropomorphic climate change. We do not have a significant effect on climate. Look for propaganda that serves political ends. The idea of anthropomorphic climate change is being used to push the destruction of prosperous countries, and capitalism as an engine of prosperity. One statement suggests that we have a significant impact on climate. We do not. The sun is the main driving force, and volcanoes have a significant effect. Carbon dioxide is not a culprit. It is necessary for the sustenance of life, and represents a tiny proportion of the atmosphere. It does not drive climate change.
79. Not being an educator, it was a bit confusing. But once I took the time to read carefully it was understandable, with some work on my part.
80. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
81. The terms "cross-cutting" and "intertwining" are confusing at best. This attempt to intermingle three levels of cognition regarding science is very confusing and to what end, at that. Why aren't that standards simply setting out the core concepts needed for functional literacy and practice in science? Rather than cross-cutting why not simply call them "ways of looking at the world"?
82. I believe that some of the wording that was added however is not accurate, as mention prior I have concerns with the paragraph at the bottom of page 2 which explains patterns, I strongly disagree with the statement that identifies the Science and Engineering Practices to the scientific method, if anything in our current document it is related to the Inquiry process not the scientific method. Science has changed even since I was in high school 25 years ago, the scientific method is a mode of communicating findings not the way that science is done.
83. Take all the green out. Non- experts clearly wrote the additional pieces and do not have an understanding of the science and engineering practices nor the crosscutting concepts.
84. no comment
85. I feel the first year might be different by after that all should be ok.
86. Messy
87. N/A
88. nobody cares.
89. There IS one scientific method, and it works.
90. The Introduction itself explains well the design and intended implementation, but on page 4, the Core Ideas, Life Science, L\$ section: evolution is a not a theory, (or a theory in the science discipline). unity and diversity of organisms IS a result of adaptation, which is a component of evolution.
91. There is no mention of the scientifically accepted concepts of evolution or natural selection. These are core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.
92. It makes it seem like Science is an afterthought.
93. The introduction to each grade level is adequate at this time.
94. n/a
95. State additions help considerably. Before was too vague. A standard needs to be well-defined. How it is taught and how kids' understanding is assessed is left to the teachers as it should be.
96. As a teacher, yes, I'm not sure about as a parent.
97. I have not had the opportunity to read the introduction.
98. I was appalled to read "formerly known as the scientific method". The scientific method remains the cornerstone of science and being dismissive of the term is not helping! I felt the introduction went into too much detail with examples and was overall too long-winded. I was glad that it refers to energy and matter, unfortunately changes suggested later on in the document now break this reference by replacing "energy and matter" with "stability and change" inappropriately where it's use was correct before. I am curious who made these edits as they were clearly not made by scientists.
99. Yes, the introduction is easy for me to read, but some may find the language or format daunting.
100. As I read the introduction it is very reminiscent of the Framework. However, that is not what I

necessarily see with all the edits in the rest of the document.

102. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
- 103.
104. The introduction does a good job explaining the strands and the naming conventions.
105. The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.
106. The introduction is good, up until the point where it is edited to make the language on what evolution is and how it is to be taught less clear.
107. See previous comments
108. It's fine.
109. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
110. Outside of previous language the directions are predominately clear.
111. I must reject all changes due to ending appropriate language regarding accepted scientific method  
The Introduction provides a high level view of the concepts. It does not provide an explanation of how the standards are designed or intended to be implemented. That information would require volumes of content for each topic.
- 112.
113. The science and engineering practices were not formerly known as the scientific method.
114. There are many things missing from these standards. Nature of Science is so important. I was hoping to see an improvement in this area, not just a glancing explanation.
115. Language is confusing.
116. Good use of image and examples.
117. Adequate
118. I like the separation of science instruction into three dimensions; it makes the abstract ideas of science more concrete and organized, and shows their interconnectedness.
119. The introduction is helpful in understanding the purpose and thought process behind the standards. I do worry that this is based on a lot of theory and not so much in functional practice.  
The introduction section gives a nod to the "Framework for K-12 Science Education" and a three dimensional approach to science education. However, the core ideas (pg. 4) needs to be removed and replaced by disciplinary core ideas being used by the rest of the US. The "knowing and using science" borrowed from the United Kingdom and does not reflect the most current research in science education. I am not sure how or why these were selected. It will do our teachers and students a GRAVE disservice by focusing on content and practices not used and supported by the rest of the nation. Further, the emphasis of certain cross cutting concepts at grade levels also does a disservice. These are meant to be transdisciplinary. More than one cross cutting concept can be emphasized.
- 120.
121. Engineering practices is not the same as scientific method.
122. a bit dense for average reader without science knowledge  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
123. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
124. As sent by the 111 science specialists in November 2017 (left unchanged).
125. The changes are unacceptable.

126. Needs to go back to review.
127. The standards must be reviewed to include elements that are taught in other states.  
The introduction is confusing. While the last set of standards was divided into 6 strands, this set has
128. 10 core ideas, but they are linked to specific scientific domains, i.e., physical science, life science, earth and space science. The inquiry process has been removed as a core idea.
129. It needs review.
130. Why can't the state just adopt the NGSS Standards?
131. Easy to understand.
132. Evolution is referred to in a misleading way or is removed. This is unacceptable and must be changed. Otherwise, the introduction does provide a useful overview.  
In general yes. However, some recent revisions muddy rather than clarify the introduction, and in some cases are factually incorrect. For example: "One example of a crosscutting concept can be seen within patterns. Patterns are present in all science disciplines and much of science is about explaining observed patterns. In life sciences, classification systems represent patterns." No. Classification systems represent evolution relationships among organism in simplified form. In other words, a classification system represents a specific hypothesis of evolutionary relationships. Classifications which merely represent patterns (such as an identification guide which groups flowers by color) are rejected as unscientific. The distinction between artificial and natural (process-based, scientific) patterns is a critical concept which the author of the above revision apparently does not understand..
133. I have not read the full draft, so have no comment on this
134. We should only be covering evolution in school. Creationism should be kept separate from schools.  
Overall the introduction is written well. Changes that need to be made:  
Pg. 3 -- delete "formerly known as the scientific method". The practices should not be reduced to a single set of procedures. Possible solution: delete the wording "formerly known as scientific method".
135. If a desire to include additional information, insert "which includes discussion and use of scientific methods" after "science and engineering practices". This can be done throughout the document where the words "formerly known as scientific method" are written in each grade level introductions.
136. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
137. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
138. Send the standards back for review.
139. Explain evolution.
140. Include more information on Evolution, and omit all mention of "Intelligent Design".
141. Sad but it does say how it should be implemented  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
142. Quite clear as it was written originally. The changes are not clear...
143. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
144. Understanding the theory of evolution is critical to the fields of medicine, biology, and more.  
The removal of facts about evolution has rendered this entire 2018 Science Standard Draft a joke and until this is completely revised and EVOLUTION which is based on substantial facts and evidence is restored its useless. I have no problems with mentioning that Christianity believes otherwise in INTELLIGENT DESIGN but that this is not supported by facts and evidence.
145. Scrap and start over. Too many bubble concepts. Do you really need an 85 page document?
146. ....
147. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.

151. Continue to teach evolution. Do not remove it to teach creationism

152. Could use some work

These are moronic standards. They are a true disservice to students and educators. Look to Bertha

153. Vasquez who teaches in the Miami, FL school system. She works with Richard Dawkins on teaching evolutionary science to her kids.

The vast majority of the introduction seems well designed, however the actual standards don't seem to completely reflect this. In particular, HS.E2U2.17 doesn't provide specific guidance with regard to "theories and scientific evidence surrounding the origin of the universe" and HS.L4U2.31 fails to do

154. the same with regard to biological evolution. This leaves the core ideas unsupported. If standards are "what a student needs to know, understand, and be able to do", then they should be elaborated upon much more specifically. For example, the Key Concepts listed under HS.L4U2.31 includes artificial but not natural selection.

Yes. They are sufficiently informative. However, throughout the document, the science and engineering practices are followed by the statement: "formerly known as the scientific method". This

155. is not the case and the Framework makes this very clear. These are different approaches and should not be conflated. By using this term, it makes it look like we just changed the name. This is absolutely not the case. I would refer the committee to this 2-page summary:  
<http://stemteachingtools.org/brief/32>

156. Refer to my response to question 17.

Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.

157. The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.

The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.

The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.

158. For someone new to this process, all is very long and not very concrete. I like that the difference between curriculum and standards was explained, for example, but it's not clear to me how much more 'curriculum' the teachers have the freedom to develop given the amount and detail of the standards, which don't just include topics but detailed instructions on what activities the students are supposed to perform.

Other specific comments:

Page 3, Science and Engineering Practices

The scientific and engineering practices included in the standards are not 'formerly known as the scientific method'. 'The scientific method' is a formal, specific process founded in the philosophy of science and sometimes known as 'strong inference'. It is the gold standard for how conclusions are drawn, and while many of the practices listed here are in practice relevant, they are not part of the formal scientific method.

The scientific method or 'strong inference' method of reasoning requires at its core multiple hypotheses, not a single one, so the next line should be revised to read 'hypotheses' if it is included at all.

Page 4: Core ideas table

L4: 'the theory of evolution' does not 'make clear' the unity and diversity of organisms, but instead provides an explanation for it. Providing causal explanation is not the same as simply clarifying that diversity exists, which anyway is done by finding lots of different organisms, not by any theory.

U3: Why don't you think that 'products' should 'serve human ends'?

U4: What are the negative implications of science?

Summary table on page 20

Why are there no examples for U3, knowledge produced by science is useful for products, in the life



science standards? Plenty of examples to choose from, including communicable diseases, medical diagnoses and treatments, agriculture practices, food production and consumption.

159. Vague and misleading regarding Life Science teaching Evolution as a widely accepted theory in science.
160. Needs to include consideration of what science CANNOT explain, so that students will realize the limitations of science.
161. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
162. seems fine

Basically a good introduction. I take strong exception to the comments on pg 3 that states that the Scientific Method promoting a hypothesis that is tested and then concluded is a "linear process". Obviously, the person who wrote that has never performed scientific experiments. And on page 4, the idea that evolution is a theory and that everything has positive and negative effects must be removed. They are both erroneous statements of bias. And tell me, when are "products" made that do not "serve human ends"? On page 6 the Dept of Education starts replacing the word "Core" with "Essential" - that should be changed back because it again shows a bias and does not reflect an unbiased approach to the need for imparting scientific knowledge to students.

163. Insufficient detail on scientific concepts.
164. Please revise L4 Evolution theory statement.
165. It is understandable.
166. All standards need to be included.

For high school students, the paragraph on p. 62 states: "Students in high school should have access to up-to-date information in the field while simultaneously gaining understanding of the historical developments which shaped today's understandings within the field. The Standards for life science encompass the areas of cells and organisms; ecosystems, interactions, energy and dynamics; heredity; and biological diversity." However, it seems to me that students are expected to understand biological diversity without really knowing how it comes to be.

Below the introductory paragraph on p. 63 is a multicolored table. The header on the left of this table appears to summarize, "The Life Sciences Essential Standards (LSES) (that) are intended for ALL students to learn across 3 credits of high school science courses."

The numbers of these essential standards devoted to different topics within the entirety of life sciences (pp. 63-68) are:

167. Ecosystems: 2; Cells and organisms: 8; Genetics: 3; Evolution: 1.
168. I find it interesting that all of biology can be captured for high school students with such brevity, but this is how it seems. However, it is even more interesting that while Evolution is considered the most fundamental concept in biology, the single standard on Evolution in the LSES (p. 68) is: "Obtain, evaluate, and communicate evidence that describes how inherited traits in a population can lead to biological diversity."  
This statement is incomplete in almost every way regarding the consensus among biological scientists as to what evolution is and how it occurs. Specifically, there is no mention of what natural selection is, how it works on traits within and among populations of organisms, how it allows for particular heritable traits to be transmitted among generations, and how it may lead to evolutionary change. There are key concepts mentioned within the table that students are supposed to master (e.g., adaptation, artificial selection, competition for mates, coevolution), but there is no clear connection between the standards and how these concepts will be understood.

169. No comment.
170. This wording is confusing: "Phenomena are events or situations that are observed to exist or happen, especially those whose causes or explanations are in question." The causes or explanations "are in question" or are the causes and explanations "unknown"?
171. It explains it but the details are hidden, which is wrong. The main point should be in the introduction.

172. **[No Answer Entered]**

173. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
174. Adding and maintaining teaching Evolution needs to be continued.
175. There is way too much information that is cluttering up these standards. It is hard to see what is

going on and where to start and where to finish. Take a look at New York State standards they are much clearer on what the teacher should be looking at.

<http://www.p12.nysed.gov/ciai/mst/sci/documents/p-12-science-learning-standards.pdf>

176. Evolution. PUT IT BACK.

I have concerns about the number of minutes per week listed for teaching science. There are many opportunities for integrating science instruction with reading, writing, and mathematics and the table of minutes does not make clear if this type of integration into other subject areas can be included in number of minutes specified. Especially in schools with half day kindergarten, devoting 90 minutes a week solely to science instruction is not realistic, unless those minutes can be counted as part of an integrated study of reading, writing, and math.

177.

178. Teach Science and facts in Schools not faith and religion.

179. No. Too complicated.

180. N/A

181. No comment.

182. See comment #9

"The unity and diversity of organisms, living and extinct, is the result of evolution." Is clearly the more scientific supported statement and should remain. Removing it would obfuscate the intent of science class in that it would be unclear if teachers are supposed to teach science as it is best understood or adhere to religious opinion.

183.

184. I saw no issues with the changes made to the introduction. I feel it provided more clarity.

185. They are satisfactory.

186. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.

The introduction states, "Standards are what a student needs to know, understand, and be able to do by the end of each grade. They build across grade levels in a progression of increasing understanding and through a range of cognitive demand levels." While clearly stated, the standards themselves are not nearly comprehensive enough or rigorous enough. You must give more performance related objectives in order for the local districts to develop year long curricula.

187.

188. To step away from normative terms such as "evolution" without justifying or in effect disproving evolution calls into question the method by which the standards were designed

189. It's acceptable.

190. Please do not muddy the language regarding evolution

191. Teach Science

192. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.

193. Revert all of Diane Douglas's changes.

If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.

194. No much difference between 2014 and current

I have spent some time in the "A Framework for K-12 Science Education" that I believe these new standards were based on. Someone who has not done so is not likely to understand the difference between big ideas and key concepts unless training are administered or teachers are given more time to review standards before teaching them next year.

196.

I am concerned you didn't even have the expertise to correctly describe the Earth's crust on a public document. I'd be embarrassed....truly I feel for you. Like I said...What I am understanding is that we've got teachers with limited knowledge of science writing this curriculum and if that's what you're trying to convey than you did it! Nice! But I don't think that's what you're trying to do. I'd do it for free honestly...I'd review your science materials because I actually care about the children and what they learn. I've definitely got the expertise to write all the Earth Science and Space Science here.

197.

198. My general comments are included previously and apply to the various grade levels.

199. Evolution should be taught, clearly, in our schools. Anything otherwise is a violation of the separation of church and state.
200. Organization is okay.
201. I appreciate the attempts to include a broader understanding of the scientific process in the standards, however I do not see that well-reflected in the standards themselves.
202. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
203. The introduction is clear about how the standards are organized and the importance of the intertwining of core ideas, crosscutting concepts, and scientific practices.
204. Removal/replacement/minimizing evolution is completely unacceptable.
205. Again, the framing of the verbage is sneaky and backhanded
206. Needs to be redrafted to remove intelligent design options.
207. The theory of evolution needs to be taught in school. Colleges expect students understand and be educated on this subject, and so many careers. Deleting the word and using analogies is childish and immature.
208. none
209. I'd have appreciated a bit more detail but I realize how difficult that can while maintaining readability, be so it's not a big deal.
210. As a former educator I don't see information on how the standards are intended to be implemented. The information is very broad
211. It does not include an understanding of the progression of standards but is thorough and provides a solid overview of the standards and how to use them.
212. Agree
213. The introduction has unnecessary information that takes away from the design and implementation
214. The introduction under the Life, Physical and Earth and Space Science is not necessary.
215. It provides enough information to know that these are inadequate, politically driven standards.
- The following paragraph needs adjustment:  
"One example of a crosscutting concept can be seen within patterns. Patterns are present in all science disciplines and much of science is about explaining observed patterns. In life sciences, classification systems represent patterns. In physical sciences, atomic structure is a pattern. In earth and space sciences, tectonic processes follow a pattern. Using graphs, charts, maps, and statistics in combination with the science and engineering practices, students can use their knowledge of patterns to formulate investigations, answer questions, and make informed predictions about observed phenomena."
216. Classification systems are a result of patterns, not a representation.
- In all science disciplines, patterns are used in conjunction with data to form an explanation for observed behavior or make a prediction of future behavior.
- The use of the phrase "The science and engineering practices, formerly the scientific method..." is misleading. Scientists use science practices, not a set method for each experiment. The use of the term "scientific method" has not been a part of professional scientific practice for decades.
- The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
217. While the introduction appears to mirror the NGSS Standards and NRC Framework, edits such as "formerly known as the scientific method, the science and engineering practices..." illustrate deep ignorance of how scientific practices, from field work to argumentation with evidence, represent a profound shift in understanding of how scientific knowledge is constructed. There never has been "the" scientific method, despite the stereotypical belief that hypothesis testing is the only method to be taught and learned.
218. I found the Internal Review additions to greatly improve the Introduction section.
219. I found the Internal Review additions to greatly improve the Introduction section.

220. They do not explain what the process was and who implemented the changes regarding the elimination and playing down of evolution. These changes cannot be accepted. I see no explanation here as to why these changes were made.
221. This introduction is slightly better than the 2004 standards, but it will not prepare teachers to understand 3-dimensional implementation.
1. The difference in high school essential standards and standards plus is not clear.
  2. It is incorrect to refer to the science and engineering practices as "formerly the scientific method"
  3. I do not believe the following disclaimer is enough to prevent many teachers from using the key
222. concepts as performance objectives, just like the current flawed standard lists.  
"Suggestions for key concepts and connections to other content area standards are included to assist teachers when implementing the Science Standards and are not intended to be the minimum or maximum content limits."
223. Do not alter the standards to weaken true science re: evolution, etc.
224. Original language should remain
225. It is very comprehensive.
226. While I support the removal of the term "scientific method", the very wordy replacement, repeated multiple times throughout the document, needs to be rethought.
227. Teach evolution. Evolution is science.
228. The Key Concepts column makes sense. It gives teachers some direction on where to go with the standard. Without them, we would struggle to come up with reasonable test questions. If I cover waves with light and someone else covers them with springs, the state testing might be confusing for one group or the other.
229. They are generally well set-up
230. nothing to comment on by me
231. The integration of science study, the nature of science, and technology, and the cross cutting concepts are well explained.
232. No comment
233. It is Christian-based.
234. Only SCIENCE in Science class!
235. Seems very confusing, with all of the bubble charts.
1. Page 2. I do like the addition of the discussion of patterns as a crosscutting concept.
  2. Page 3. The addition of "Formally known as the scientific method" detracts from the significance of "science and engineering practices." As a scientist and science educator, the use of the term scientific method implied that science was like a recipe, going step by step. This is far from how real science is done.
  3. One thing that I failed to have incorporated into the original draft of the Science Standards (I was on the Standards Committee as well as the NGSS review). In the 40 or so years that I have been a practicing scientist, I never asked a question or defined a problem without first making an observation. In the Framework and NGSS they go so far to use the example of asking the question "Why is the sky blue?" How can you ask that question without having first made an observation?
  4. Page 4: The individuals who edited what was presented to them by the Standards Committee clearly do not have an understanding of what a theory is. A theory is based on evidence, not belief!!
236. Evolution is real. There are important details that we are trying to understand: gradual evolution vs. punctuated evolution. Bacteria have gradually evolved to become resistant to antibiotics. Ask the dinosaurs about punctuated evolution! There is a theory called gravitational theory. Gravity is real and the predictions of Einstein, based on observational evidence, have supported his General Theory of Relativity, but there are still experiments going on.
5. Page 9, etc. As others have written, I am not happy with the addition of the "Key Concepts" column. As has been stated by others, these are just words without connection to crosscutting concepts and as such become a checklist without a deeper understanding of learning.
  6. In general, because of my area of expertise, I will limit my comments to Earth and Space Science.

Because of the setup of this form and the fact that I have received a message that my session will end soon. I will call this done and redo this at a time I can input all of my comments. There does not seem to be a way to save and return, just "done."

237. Get rid of "intelligent design." Restore references to evolution.
238. Again it is too broad to understand exactly what they want.
239. Can be improved
240. Get rid of "intelligent design." Restore references to evolution.
241. Don't revise.
242. Na
243. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
244. The referenced to evolution must be reinstated.
1. Page 1, introduction, 2nd para, 1st sentence, last two words (and various places throughout text) - material world is a better descriptor, includes human created phenomenon not typically found in the natural world.
  2. Page 3, 1st para, 1st sentence (and various places throughout the text) - "Suggest deleting "Formerly known as the scientific method," What is described in this section as science and engineering practices is a much broader process than the scientific method which is more narrowly limited to the observation and description of phenomena; use of hypotheses to explain phenomena, make predictions and quantify new observations; and use of properly performed and independent experimental tests of the predictions. This practices within the scientific method are not replaced by the described science and engineering practices, but rather are an essential methodology utilized within that process.
  3. Page 4 Table Core Ideas for Knowing Science P4 (and various places throughout the text) - As written this core idea does not well reflect what is given as one of the big ideas of science education - that the total amount of energy in the Universe remains the same and that energy can neither be created or destroyed. Suggest deleting the added phrase "in a closed system" or changing it to "in the Universe."
245. 4. Page 4 Table Core Ideas for Knowing Science L4 (and various places throughout the text) - The suggested rewording in 1.4 changes the meaning of the statement and should be removed. The original statement succinctly communicated that evolution is responsible for organism unity and diversity. This is current accepted scientific theory. It is an important organizing concept in scientific research and our understanding of the natural world. As such it is appropriate to include in life science standards. The revised language in 1.4 misconstrues what the theory of evolution is as well uses the word "theory" in a way that is inconsistent with established scientific meaning.
5. Page 4 Table Core Ideas for Using Science U1 (and various places throughout the text) - It is generally understood that the purpose of science is to "explain phenomena and (sometimes) predict" not necessarily to always "find the cause or causes of phenomena" (although at a broader level that may be one of the goals of science). Suggest retaining original wording.
6. Page 4 Table Core Ideas for Using Science U4 (and various places throughout the text) - suggest rewording "Applications of science can have positive, negative, or neutral...."
- This section:  
"One example of a crosscutting concept can be seen within patterns. Patterns are present in all science disciplines and much of science is about explaining observed patterns. In life sciences, classification systems represent patterns. In physical sciences, atomic structure is a pattern. In earth and space sciences, tectonic processes follow a pattern. Using graphs, charts, maps, and statistics in combination with the science and engineering practices, students can use their knowledge of patterns to formulate investigations, answer questions, and make informed predictions about observed phenomena. "
246. Is muddled and meaningless. What is a teacher supposed to do with that? "atomic structure is a pattern" is not something any physicist has said ever. Does the author think this is an episode of Numb3rs?
247. too confusing
248. It provides enough information if one comes with a lot of background knowledge. I hope ADE provides training.
249. It needs to show how propaganda has seeped into the standards.
250. It is sufficient.



1. Page 2. I do like the addition of the discussion of patterns as a crosscutting concept.
2. Page 3. The addition of "Formally known as the scientific method" detracts from the significance of "science and engineering practices." As a scientist and science educator, the use of the term scientific method implied that science was like a recipe, going step by step. This is far from how real science is done.
3. One thing that I failed to have incorporated into the original draft of the Science Standards (I was on the Standards Committee as well as the NGSS review). In the 40 or so years that I have been a practicing scientist, I never asked a question or defined a problem without first making an observation. In the Framework and NGSS they go so far to use the example of asking the question "Why is the sky blue?" How can you ask that question without having first made an observation?
251. 4. Page 4: The individuals who edited what was presented to them by the Standards Committee clearly do not have an understanding of what a theory is. A theory is based on evidence, not belief!! Evolution is real. There are important details that we are trying to understand: gradual evolution vs. punctuated evolution. Bacteria have gradually evolved to become resistant to antibiotics. Ask the dinosaurs about punctuated evolution! There is a theory called gravitational theory. Gravity is real and the predictions of Einstein, based on observational evidence, have supported his General Theory of Relativity, but there are still experiments going on.
5. Page 9, etc. As others have written, I am not happy with the addition of the "Key Concepts" column. As has been stated by others, these are just words without connection to crosscutting concepts and as such become a checklist without a deeper understanding of learning.
6. In general, because of my area of expertise, I will limit my comments to Earth and Space Science. I previously alluded to the confusion caused by writing "refer to standard" in the standard. Refer to what? This lack of appropriate detail is very harmful to the overall integrity of this enormous effort.
252. Critically, under Core Ideas for Knowing Science point L4 should be strengthened in scope and in direct language. Replace "seeks to make clear" with "explains." And change end of sentence to ". . . of organisms and the processes by which they speciate and evolve to fit their environments."
253. No comment.
254. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
- Generally the introduction is strong and helps me understand the standards. With all the ADE
255. additions, I question whether the time frames for instruction are appropriate. It seems like those will need to be doubled or tripled in order for teachers to now teach all of the vocabulary out of context.
256. I am not a teacher, but believe it is important to include the teaching of evolution as appropriate at every level.
257. This section would benefit from examples of how the crosscutting concepts, core ideas, and practices might be represented in a curriculum exemplar.
- The diagram is useful for understanding how core ideas are used in the scientific method, which in
258. turn leads to discoveries that can be combined with other scientific fields and academic disciplines. Very practically laid out.
259. N/A
260. The language is generally clear enough if you read it through a few times. I would expect this from any version of standards due to the depth and breadth of the subject matter.
261. Yes, the graphics and text are clear
262. A good overview for teachers and parents who may not be familiar with the standards.
263. Please teach evolution and not creationism
264. Well introduced.
265. This not the reason for my current comments.
266. Disagree
- On page 4 L4 by eliminating "is the result of evolution" muddies the water. The theory of evidence
267. and its overwhelming evidence is directly responsible for the change through time and explains extinction and the proliferation of new species.
- I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
268. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.

269. The formatting is poor. The Introduction seems to skate around how to actually use these standards.
270. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
271. See above
272. gibberish
273. Should stick to factual scientific focus
274. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
275. See comments above.
276. I specifically object to the following language change: "L4: The theory of evolution seeks to make clear the unity and diversity of organisms, living and extinct, is the result of evolution organisms." By substituting "theory of evolution" for "result of evolution," the author(s) imply that evolution is somehow untested science. This is a common tactic, using the colloquial definition of "theory" rather than the scientific.
277. Like science itself, the standards can appear intimidating and complicated. The introduction approach seems logical, although involved. The sections lay out the approach, define terms, and establish structure.
278. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
279. The present introduction section is sufficient.
280. no comment
281. Although I disagree completely, yes, they are written in English.
282. Not having a scientific method is a step in the wrong direction when teaching science. It does not have to be a focal point, but trying to integrate it throughout the school year will be forgotten by the students.
283. It is thorough, but contains of a lot overlapping information which makes it hard to concisely explain. I would like to see more information about safety in the standards.
284. The introduction is overwhelming and confusing when discussing crosscutting concepts and the science and engineering practices.
285. Examples are needed. Please show me how lesson plans are intended to be formatted and documented, in a realistic way.
286. I like that they are concise but I feel they are equally broad.
287. Soooooo many numbers and letters and..... If we want different sciences to be able to teach some of the same essential standards, then we need to drop some of these....
288. I did not really need it to understand how the standards are designed to be implemented. However, this would be useful to those new to the teaching field.
289. The draft standards are poop.
290. The interlocutory section is okay.
291. As noted on the previous page, I would like to see the committee and external reviewer/consultant names included.
292. Have not read the document, but continue to stress that changes to science curricula should not reflect the religious bias of the current secretary of education.
293. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
294. understandable by a layman.
295. KEEP the word EVOLUTION in the standards. Evolution is accepted science . There are NO alternative theories that are no religiously based.

296. Overall, I get the idea it is presenting.
297. Deleting the work evolution and Darwinism does science a disservice
298. No issues
299. N/a
300. This feels very business-talky and not very actionable. Please provide clear examples of how these core ideas and methods could be effectively communicated to students. I know this is fleshed out in more specific sections, but it would benefit from sharpening from the beginning.
301. Beautifully clear, in its original formulation.
302. I know what is being stated here because I have been an active participant in the AZ Science Teacher Association's outreaches and workshops in teaching science teachers about 3 Dimensional Instruction. I don't think there is enough here to truly help those not familiar with 3D instruction to implement effectively.
303. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
304. The coding was unclear. Was not clear about the standard number(.7 or .2)
- While there are manifold places that these standards could be improved at all levels, the purpose of my feedback is to state that the recent proposed changes to these standards are predicated on religious bias and a clear lack of understanding of the truths of modern science, and even an attack on science itself.
305. Moreover, standards for science teaching are meaningless and, therefore, worthless, in a political culture where budget cuts and tax cuts for the rich are placed at the apex, and the lowest classroom teacher salaries in the nation, and lack of funds for science teaching equipment, even basic computers in the science classrooms are cut from every budget, every year.
- It's your children and grandchildren...
306. I agree that one can easily understand the objective of this indoctrination, which still means this is a deeply troubling document!
307. The science instruction wheel is very valuable.
308. Breakdown of core concepts is acceptable.
309. Clearly states the organization and the framework material and the graphic.
310. Leave the present standards as they are.
311. I think with district training and teacher discussions there is enough information.
312. The introduction is fine.
313. Does not need any non scientific hypothesis such as creationism
314. N/A
315. I would like the standards to be designed by experts teaching in the fields and in the grades discussed.
316. The whole thing is a sham and has nothing to do with a good education?
317. Keep Diane Douglas out of the details. Its the last day to comment. My only comment is Keep Douglas away from it! It was better before her gobbly gook attempts to blur science and her particular religion.
318. Do not mix religion and science.
319. Examples added for cross cutting concepts are not good examples. The graphic for cross cutting concepts does not represent how these are a "lens for understanding core ideas". Science and engineering practices are NOT formerly the scientific method. They are NOT a process. Timelines and assumed minutes on page 6 are not realistic, particularly for rural areas. Why are we using an international document as opposed to recommendations on core ideas from our National Research Council?
320. Believe adding the learning progressions from the Working with the Big Ideas in science will help and

- remove the key concepts.
- The added column for key concepts is an overreach of the state government. Key concepts are implied within the state standard and takes away freedom for the science teacher to deliver content from the standards.
321. implied within the state standard and takes away freedom for the science teacher to deliver content from the standards.
322. In general I think the deleted wording in the "DRAFT Released XXXX DRAFT" is generally to be preferred.
323. See previous comments.
- Now you will try and water down negative remarks by trying to show that "complainers" did not read the entire draft...nor do they have the intellect that you people feel you have. Therefore all negative remarks above are worthless if the rest of these blocks are not filled.
324. remarks above are worthless if the rest of these blocks are not filled.
- Egotistical clowns
325. Enough information and context is provided.
- Boy, that was a lot of gobbledegook that only Administrators could love.
326. You know what's missing? Any reference to how knowing how to think critically will help future employment/be a productive citizen. (Even if a house wife helping to raise the children. Or even if a Mayor or a Governor.)
327. I will not consider any changes if the teaching of evolution is in jeopardy. I have taken the time to read the standard for every grade level.
- These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.
328. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.
- What utter nonsense.
329. Everything has to be read carefully for understanding.
330. The wording regarding the core idea of evolution has been weakened, and makes less sense than previous standards
331. More information
332. No religion in classes
333. Faith, by definition, requires the exclusion of facts.
334. Easy to read, which is important for obtaining community feedback
- Consider the use of the term "inquiry" verses "investigation" in order to align the standards to the actual work of scientists. Investigation is misleading for teachers and students making it appear as if "doing experiments/labs" is the only time scientists are engaged in science. The 3D learning graphic in Figure 1 does not show the interconnectedness of the core ideas, crosscutting concepts and practices. The scientific method and the science and engineering practices are not one in the same nor is the scientific method being replaced by the practices as the wording "formerly known as" would imply. The phrase "use of models or simulations" is redundant as simulations are a form of models. Reasoning or the inquiry process should be utilized rather than the term scientific "literacy." Core idea U1 narrows the purpose of science to solely finding causes of phenomena.
335. practices. The scientific method and the science and engineering practices are not one in the same nor is the scientific method being replaced by the practices as the wording "formerly known as" would imply. The phrase "use of models or simulations" is redundant as simulations are a form of models. Reasoning or the inquiry process should be utilized rather than the term scientific "literacy." Core idea U1 narrows the purpose of science to solely finding causes of phenomena.
336. I believe the introduction provides as much context as it can. However, training will be necessary for the vast majority of teachers to truly understand how to implement.
337. The three dimensions of science instruction explanation is a nice clarification.
338. Information is informing, however, to make things simpler, put the order in which it would make sense to teach the content, in the order of the standards!
339. science is not my first course of study so I can not give pin point on this and the below questions.
- I agree I just hope that combining some topics does not take away from the importance of the topics because the new teachers do not see them broken down. Such as combining Biochem into Cells section. Cells are in themselves very important because they are the section that district-wide fails. Some of the sections might need to be broken down even more as separate sections.
340. Some of the sections might need to be broken down even more as separate sections.
341. I'm not sure how many people will actually read it, but it provides good information.
342. I was confused at times while reading these standards.

- 343. keep evolution; reject intelligent design
- 344. The standards and how they are identified and connected is explained.
- 345. It does tell me what the kids need to know by the end of the grade level.
- 346. N/A
- 347. WEAK

**Total Respondents 347**

**17.** The Appendices are a helpful addition to the Science Standards and supplement the information provided in the Introduction section.

		<b>Response Total</b>	<b>Response Percent</b>
Strongly Agree		<b>112</b>	<b>12%</b>
Agree		<b>532</b>	<b>56%</b>
Disagree		<b>166</b>	<b>18%</b>
Strongly Disagree		<b>137</b>	<b>14%</b>
<b>Total Respondents</b>		<b>947</b>	<b>100%</b>

**18.** Please comment on the Appendices.

1. Perfect
2. Could probably find information elsewhere in a more efficient manner.  
The words that were added in green, in quotation marks here" are unnecessary and aren't indicative of actual science stating the words "believed to lead" are not a scientific statement and should be removed as in the original draft.
3. Over countless generations changes resulting from natural diversity within a species "are believed to lead" to the selection of those individuals...
4. I don't care
5. Appendices are vital to understand the standards
6. The cross curricular references to ELA and Math are extremely useful for students to learn all concepts across all areas.  
There are a couple specific wording changes that should be made:  
  
"Any theory or model is provisional and subject to revision in the light of new data even though it may have led to predictions in accord with data in the past."  
  
This statement should say "any theory, model, or LAW is provisional..." because all science follows the same rules. There are many scientific laws that have been overturned through the years.
7. Regarding L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.  
Which states, "changes... are believed to lead to..." I see no other laws theories or models that use the phrase "are believed to." Please change the wording to be consistent. For instance, "Gravity is believed to cause objects to fall" and "According to Coulomb's law, it is believed that opposite charges repel and like charges attract." Or remove the phrase in the statement on evolution.
8. I feel the appendices should be made to match each specific grade level.
9. The Appendices is very lengthy and not an easy read. Maybe one or two sentences to get the point across.
10. The purpose of the appendices is unclear. Are, for example, the P1 core ideas what every students should know and this is where assessment will be pulled from? (which would be awesome)



11. #2 is especially helpful to think about the differences between science and engineering.  
#3 can guide middle school and high school teachers of other subjects integrate science.
12. The appendices would benefit from having the information in a graphic format more than just text.  
Use of charts or tables would help make the appendices are more effective resource
13. It would be helpful if the appendices were to be specific to each grade level rather than a general statement for all.
14. The appendices provide additional information on the cross cutting ideas, science and engineering practices and core ideas.
15. Explains all the different parts of the science curriculum and the components of the standards draft.
16. The appendices are a useful tool for understanding. They are one of the few parts of the standards that I feel like give practical examples of what these ideas \*look like\* in a classroom.
17. I believe the appendices add understanding by distinguishing between science and engineering practices in pages 74-78.
18. I believe the appendices add understanding by distinguishing between science and engineering practices in pages 74-78
19. They are fine statements, but not necessarily super helpful.
20. The Framework for K-12 Science Education and the Working with the Big Ideas of Science Education was a smart decision.
21. Would like to see Nature of Science information .
22. I didn't realize that they were even there at first so you may want to have a more clear reference to them. Most educators will look at their section of the standards and little else.
23. Easy to follow.
24. These are not what the committee created
25. They seem to be adequate
26. There was more information in the Appendices which gave me a stronger understanding of the science standards and what is to be implemented in the classroom.  
The wording of the explanation of Core Idea L4 on page 78 is confusing and inaccurate. First, the phrase "are believed to" is used, which represents a fundamental misunderstanding of the nature of scientific theory. Science does not deal in "beliefs," but rather analysis and interpretation of empirical evidence. In fact, this is the only instance in the whole document of the use of the word "believe."
27. Secondly, while the explanation would read better if the words "are believed to" were deleted, "Over countless generations changes resulting from natural diversity within a species lead to the selection of those individuals best suited to survive under certain conditions" is still inaccurate. The generations are not "countless," which is a meaningless word. One can, in fact, count generations. Also, the changes do not "result from natural diversity," they are caused by random mutation, which in turn contributes to the cause of genetic diversity within a species.
28. Return language about evolution to original language
29. They are very helpful and probably should be much more strongly referenced in the introduction so they are not missed.
30. No comment.
31. science vs engineering is good
31. However the other would be for scientists, not teachers/students
32. I particularly liked the section about crosscutting concepts as it lays out a few ideas and purpose of the focus.
33. Although, I would like more information to help me fully teach these topics.
34. These should be in chart format to make it easier to reference.
35. Appendix 1  
Pages 71-73  
Restore to what the teachers asked for. Remove the additions by ADE.

Appendix 3

Pages 77-79

Restore to what the teachers asked for. Remove the additions by ADE.

36. Awesome except strange and inaccurate wording of the evolution big idea
37. The Appendices does not content to the content of the standards.
38. The overall map for each grade level bonding is good and the map linking other disciplines is organized.
39. Appendices are always useful.
40. Our team has questions about the "DO" in this area.
41. They are a good source for reference.
42. Fine.
43. I like the specific nature of the new science/engineering process. This will help align instruction across schools
44. The Appendices provide greater details on the science and engineering practices.
45. Too complicated!! Should not require any appendices.
46. Needs to be written in form of objectives in a sentence
47. We need more defined standards. Is an investigation a new term for designing an experiment?
48. They should break it down into grade levels. It is extremely overwhelming to look at it all as a whole.
49. needs to be labeled better
50. It is helpful
51. They are required, if you keep this as is.
52. Better labeling would be helpful. More organized formatting.
53. It's not user friendly or grade specific. To overwhelming and wordy.
54. They are not helpful for me because again, there are no examples of what this means, exactly. Just more definitions, which is not helpful to me when I am planning a lesson.
55. Explains and summarizes the core concepts and practices. Good examples and explanations.
56. yes, it explains and summarizes the the core concepts and practices.  
  
Inaccuracy in the appendix regarding E1: "This in turn leads to movement of the plates which form the Earth's crust", PLEASE NOTE: THE PLATES ARE NOT JUST CRUST, THEY ARE THE UPPER MANTLE AND THE CRUST, THIS IS CALLED THE LITHOSPHERE! ALSO NOTE REDUCING THE CHANGES THAT OCCUR ON THE EARTH TO FORMATION AND WEATHERING OF ROCK IS OVERSYMPLOYING A VERY COMPLEX WORLD!
57. in Appendix 3 with respect to Earth Science I strongly disagree with explanation of the core ideas. For instance when it states that the plate of the earth are made up of the crust: this is completely incorrect! The plates are composed of the lithosphere: the crust and the upper part of the mantle! And if simplifies climate as a result of energy from the sun: there is a list of more than 30 things that affect climate, most of which have nothing to do with the energy from the sun. And to reduce the processes that occur on earth to the formation and weathering of rock is so shallow. So much for breadth, depth and rigor of these standards. Once again to reduce all of geology, meteorology and astronomy to two core ideas is just despicable. We live on the Earth, we need to spend more time teaching our students the facts about the Earth. Today much of what people know about the Earth comes from media, where the facts are in question.  
other portions of the appendices, at least the general parts are okay, I cannot speak to the specific core ideas for physical science or life sciences.
58. In general, the appendices are an excellent addition to the standards. Add a citation to the ADE additions in Appendix 1. Remove the inappropriate ADE addition of scientific method from Appendix 2.
59. Please consult with appropriate experts in higher education for all ADE changes made in Appendix 3 to ensure scientific accuracy and appropriateness.
60. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.

61. The very fact that an appendix is even needed speaks to the need for revision of the standards themselves. It reads more like a complex legal document than a solid framework for core scientific knowledge acquisition and practice.
62. However I believe that L4 from the Core Ideas for Knowing Science needs to be changed back into the correct wording from the Big Ideas that were used. "The diversity of organisms, living and extinct, is the result of evolution."  
Appendix 1 It seems unethical to document that they are using the K-12 Framework for Science Education and put all their own verbiage in for explaining the CCC. If they are going to footnote it they should probably use the experts language.  
Appendix 2 is perfect  
Appendix 3 page 77 P4 Should not be allowed to be modified from the original statement. It should say: "The total amount of energy in the Universe is always the same but can transferred from on energy store to another during an event.  
Page 78 L4 Should be back to the original : The diversity of organisms, living and extinct, is the result of evolution.  
Appendix 4 and 5 are good.
64. no comment
65. In the appendix about the practices:  
The scientific method and the scientific practices are NOT the same thing. Remove any references to the scientific method. THE scientific method does not exist; there are many scientific ways to answer questions, not just one.
66. Again, the "internal review" edits only damage the rigor and our ability to accurately teach real science concepts.
67. I
68. N/A
69. again, no one cares
70. Not needed
71. Good inclusion of Science and Engineering practices.
72. There is no mention of the scientifically accepted concepts of evolution or natural selection. These are core concepts in biology that help explain vital parts of life science. It is unacceptable to not include them.
73. Teachers in this state do not need Appendices. They need education to be fully funded so that there are Science Labs and Materials, in all Science Classrooms.
74. n/a
75. It's a lot of extra unnecessary information. The description of a what a pattern is is particularly cringe-worthy to read. It reads like it was written by someone who never took a science class before.
76. I have not had the opportunity to read the appendices.
77. Yes, it is good to see specific line items written out instead of just numbers for concepts that those who refer to each of the concepts frequently will use.
78. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
80. I didn't find them all that helpful. They are quite wordy and I'm not sure most teachers would even take the time to read them.
81. The appendices could function as the standards.
82. The standards as revised by staff compromise their intent and therefore compromise the ability of Arizona students to deal with the modern world.

83. Most of them are good, except for the edits that involve speculative statements about dark matter and anti-matter, and that state that the Universe is not a closed system.
84. They're fine.
85. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
86. They are very repetitive of the introductory material in the beginning and in each section.
87. Helpful supplements to further explain the concepts.
88. I don't enjoy having to reference around multiple locations within an 84 page document to attempt to construct a meaningful trajectory for how to do my job. This would be exceptionally confusing to a newer teacher with very little support from colleagues.
89. Please replace Appendix 3: Core Ideas with disciplinary core content that more closely mirrors the disciplinary core content in "A Framework for K-12 Science Education". Also, the way the standards are currently written, appendix 2 does not hold much weight. It should! But the approach of "knowing and using science" does not fully allow for all the practices to be incorporated into the standards.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
90. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
91. As sent by the 111 science specialists in November 2017 (left unchanged).
92. The changes are unacceptable.
93. Needs to go back to review.
94. The standards must be reviewed.
95. While the appendices provide greater detail, the overall framework of the standards are lacking details.
96. There is no section for acknowledging the work of past scientists or making connections as to how science builds on itself through acquisition of knowledge.
97. The appendices are useful.
98. I have not read the full draft, so have no comment on this
99. Why is theory added in front of evolution? To be accurate and consistent the word theory (as in a scientific theory) would need to be added to all science concepts. Otherwise it's use here and in other parts tries to suggest to the reader that they are using it with a different meaning more related to the term hypothesis - which it has well surpassed.
100. We should only be covering evolution in school. Creationism should be kept separate from schools.
101. The Learning Progressions of the Practices may want to be included as an appendix.
102. Hopefully the appendices will be incorporated into lesson planning and not ignored.
103. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
104. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.  
The Appendix 2 - delete "scientific method"; NGSS has a progression document for the practices which would be helpful for teachers to see how these practices develop over time.
105. Appendix 3 - These 14 core ideas come from Working with Big Ideas in Science Education and should cite the words/descriptions from the Working with Big Ideas in Science Education.  
Possible Solution: Restore committee's version
106. Send the standards back for review.
107. Explain evolution ze
108. Provide more information on Evolution, and omit anything to do with Creationism or "Intelligent Design".

109. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
110. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
111. Refer reply in 20 above.
112. So now we're not teaching dinosaurs and extinction?
113. ....
114. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
115. Continue to teach evolution. Do not remove it to teach creationism.
116. It's all wrong!
- The appendices are a helpful addition, but I would argue that they are only helpful to the degree that
117. the standards themselves are well-written. I have already mentioned specific problems with the standards that make them less than useful to students and teachers.
118. Refer to my response to question 17.
- Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.
- The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts
119. demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.
- The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.
- The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.
120. Didn't read so can't comment.
- Good discussion of Science vs. Engineering. However, Core Idea L4 presents evolution as a theory,
121. which is technically incorrect, and fails to mention other proposed explanations of origins and development.
122. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
- Appendix 1 is questionable with the extensive comments by the Dept of Education. How about having a discussion about this appendix with the original drafters of the document?
- Appendix 3, L4 is so biased and anti-science that it is incomprehensible to a real scientist. Repeat after me, "Evolution is NOT a theory", now write it 1000 times so you get the idea correct.
123. Appendix 3, U1 should be rewritten to state "The purpose of Science is to understand the cause or causes of phenomena in the natural world."
- Appendix 3, U3, should keep "to serve human ends" because that is precisely what the purpose is. If not, then please explain other purposes.
- Appendix 3, U4, should remove "both positive and negative" from the statement
124. Ambivalent.
125. They seem adequate.
126. All standards need to be included.
127. No comment.
128. I take exception to the wording of L4 in Appendix 3: Core Ideas: "generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited



- to survive under certain conditions." It's not a belief--it's a scientific process that has been shown to be true by living evidence.
129. They do explain what is meant by certain terms, which is important.
130. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
131. L4 is highly problematic.
132. Adding and maintaining teaching Evolution needs to be continued.
133. There is way too much information that is cluttering up these standards. It is hard to see what is going on and where to start and where to finish. Take a look at New York State standards they are much clearer on what the teacher should be looking at.  
<http://www.p12.nysed.gov/ciai/mst/sci/documents/p-12-science-learning-standards.pdf>
134. We HAVE read our history of science, haven't we? This is unconstitutional - teach evolution!
135. Teach Science and facts in Schools not faith and religion.
136. Too complicated. The entire organization is too complicated. The NSF version is less so, but still too complicated. It does not need to be so. Open up the Big Ideas to include the most important ideas in science that we want students in high school science to know. For Earth & Space, I came up with 13. ALL but two are ideas that are dealt with in other science courses (so 11 OVERLAP with other sciences). Once we come up with a core of these Big Ideas, we can extend those into General Science concepts, then narrow them down TO FIT into specific science core courses from there.
137. N/A
138. No comment.
139. See comment #9  
Appendix 3:L4 the same disgusting dark ages rewrite of important scientific theory
140. Appendix 3:U3 why you would you choose a less specific and less accurate statement.  
Appendix 3:U4 changes the teaching standard from important concepts that one might take a university class on (like ethics) to an attempt to undermine science and technology  
I like the appendices but take issue to two areas. L4 undermines the strengths of the theory of evolution with the phrase "are believed to". This is already implied by your statement in appendix U2. Your addition of the aforementioned verbiage is unnecessary and insulting to the teachers as it implies they don't understand your explanation of scientific theories. It undermines the inclusion of
141. evolution in your standards and pretty clearly seems to be a political move. Please keep politics out of these standards and remove that verbiage.  
My second issue is with the limited scope of appendix U2. Although U2 includes factual data, there should also be a sentence explaining that scientific theories are not "theories" in the way lay people use them, but have a massive amount of research behind them and data to support what it says.
142. They are satisfactory.
143. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.
144. While helpful, the appendices do not provide substantive benefit to expanding the rigor of the proposed standards. Appendix 4 states, "By incorporating the Arizona Mathematics Standards and practices with critical thinking in science instruction, educators provide students with opportunities to develop literacy in mathematics instruction." This goal is not reflected in the rigor of the standards, particularly at the high school level. the verb "calculate" is used only once in a key concept for biology and not at all in the standards.
145. It's acceptable.
146. Please do not muddy the language regarding evolution
147. Teach Science
148. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
149. Revert all of Diane Douglas's changes.
150. If the state allows teaching creationism, they will also have to teach other religion's creation myths,

such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.

151. No much difference between 2014 and current

Like I said, I think appendix 3? Ya that one... review...review...review.

152.

Page 79 is disgraceful. It embarrasses me for you. I'll fix it for free...honestly I would. It's that bad.

153. I couldn't see that it added very much. I like the idea of a glossary in the current standards better

The strange mix of descriptive child development and prescriptive or aspirational formulation in the text makes it challenging to unpack. Further, statements of fact should be justified with a citation to a reliable source, rather than merely stated.

To understand this distinction between descriptive and prescriptive text, let me give two examples:

154. "As students age, their ability to analyze and predict outcomes strengthens" is a descriptive statement of child development (and one which is accurate and uncontroversial, but still needs a citation). Conversely, "In high school, nuclear processes are introduced along with conservation laws related specifically to nuclear processes" is more in line with a standard or prescriptive statement. It is sometimes unclear what the intent of a passage is; if descriptive statements are going to be made to justify ideas, they should be cited to scientific sources, as any academic work would do.

155. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.

Yes, they help to define some concepts. Please make L4 in Appendix 3 more direct, such as "Over generations, changes resulting from natural diversity within a species to lead to the selection of those individuals best suited to survive under certain conditions."

156. Appendix 4 on equity and diversity is admirable. However, I think it still suffers from a deficit framing of some students. I do like the use of "opportunity gap" rather than "achievement gap," but it still paints students from low socioeconomic status and other marginalized communities as lacking in critical experiences rather than that science instruction has failed to make adequate connections to their strengths.

157. Removal/replacement/minimizing evolution is completely unacceptable.

158. See above

159. This needs to be redrafted to benefit the education of our children.

160. While the appendices as originally written look fine, the current edits to weaken language on evolution not. These edits should be rejected.

161. The appendices are very general and still do not provide specifics for implementation.

162. The glossary in the current standards is lacking in the proposed standard.

163. Appendix 1: CCC needs to be reviewed by the standards working group as there are significant additions beyond what the group proposed.

164. Solid and helpful.

165. Agree

166. Once again too much information that takes away from the main focus.

167. Under L4 need to reinstate the original text and take out "are believed to".

168. Yes the appendices appear to supplement these inadequate, politically driven standards.

169. I especially like appendix three.

170. The use of the phrase "The science and engineering practices, formerly the scientific method..." is misleading. Scientists use science practices, not a set method for each experiment. The use of the term "scientific method" has not been a part of professional scientific practice for decades.

In Appendix 3, the following paragraph needs adjustment:

"Core Ideas for Knowing Science

P1: All matter in the Universe is made of very small particles.

Atoms are the building blocks of all normal matter, living and non-living. The behavior and arrangement of the atoms explains the properties of different materials. In chemical reactions atoms are rearranged to form new substances. Each atom has a nucleus, containing neutrons and protons,

surrounded by electrons. The opposite electric charges of protons and electrons attract each other, keeping atoms together and accounting for the formation of some compounds. Physicists and astronomers have begun to investigate other types of matter, dark matter, antimatter, and negative matter, which are also thought to be made up of very small particles. Those particles may or may not be atoms and tend to react differently to forces than normal matter."  
The inclusion of the final two sentences is not developmentally appropriate to a K-12 science standards document as such topics far exceed the boundaries of high school physics.

Also in Appendix 3:

"L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.

Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct."

Evolution is a scientifically sound explanation for the alteration of species over time. This is not up for debate within the scientific community.

172. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.

173. While drawn from the NRC Framework, the appendices are too vague and presented without research-based evidence to support the claims. They will be of little use to teachers who themselves are unfamiliar with the NRC document or experienced in doing science.

174. The Appendices supply additional insights that can help teachers and ultimately students by adding context in the relevant areas. I especially like the Internal Review changes and additions, they very much improved the draft.

175. Again, lack of reference to evolution is a major flaw.

176. While the appendices are helpful, they are not linked in a way that will engage many educators, and still fall short of providing the background and examples needed to make informed curricular choices.

1. The science and engineering practices are not the same as the scientific method!

2. This whole section in the Core Ideas is flawed, particularly with the insertion of "are believed to":  
"L4: The theory of evolution seeks to make clear the unity and diversity of organisms, living and extinct, is the result of evolution organisms.

177. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions. Species not able to respond sufficiently to changes in their environment become extinct."

3. I disagree that the following is the main or only purpose of science:

"U1: Science's purpose is to find the cause or causes of phenomena in the natural world."

4. Appendix 4 points out interdisciplinary connections, but there is nothing on health standards, which are found throughout the document.

178. Do not alter the standards to weaken true science re: evolution, etc.

179. Original language should remain

180. Teach evolution. Evolution is science.

181. "L4: The theory of evolution seeks to make clear the unity and diversity of, living and extinct organisms. Over countless generations changes resulting from natural diversity within a species are believed to lead to the selection of those individuals best suited to survive under certain conditions." There is no "belief in evolution", it is scientific fact. Remove that word!

182. They tend to be superfluous, but my opinion on that may change as I work with them more.

183. very complete

184. I did not spend much time looking at the Appendices and am not prepared to comment on this section.

185. No comment

186. I have no objection to the Appendices.

187. Only SCIENCE in Science class!

188. Shouldn't really have to use them if the language was clearer in the first place.

189. Get rid of "intelligent design." Restore references to evolution.
190. They don't help.
191. Get rid of "intelligent design." Restore references to evolution.
192. Don't revise.
193. Na
194. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
27. Page 75, 1st paragraph, first sentence – see comment 19 - #2.
28. Page 78, 5th paragraph, first sentence – see comment 19 - #3.
195. 29. Page 79, 6th paragraph – see comment 19 - #4.
30. Page 79, 7th paragraph – see comment 19 - #5.
31. Page 80, 3rd full paragraph – see comment 19 - #6.
- As with much of this document, before editing the Appendices were clear and concise. The edits add unnecessary verbiage with no gain in clarity or rigor, and at times seem geared toward weakening science. For example, I see little utility in the addition of "Because the world is too large and complex to comprehend all at once," unless one were trying to undermine students' perception of our knowledge of the world.
196. science. For example, I see little utility in the addition of "Because the world is too large and complex to comprehend all at once," unless one were trying to undermine students' perception of our knowledge of the world.
197. authors & their affiliations
198. Same as above.
199. Do not differentiate science from religious beliefs
200. They are sufficient.
201. No comment.
202. Evolution is not just a theory, it is a well-established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards, not an improvement.
203. The appendices as written by the committees are helpful. Again, ADE changes need to be reversed.
204. The appendices are helpful, but are too brief.
205. It was particularly practical to compare and contrast science and engineering. The Appendices additionally tie well into crosscutting concepts, science and engineering practices, and core ideas.
206. N/A
207. The appendices help to clarify how bad these "standards" are.
208. There is insufficient guidance to teachers in many of these sections, especially about more controversial topics such as GMOs. These are safe and well studied.
209. Great and easy reference.
210. Your veiled attempt to add Christianity to the classroom is inappropriate at best and will cost taxpayers' money when you are sued for attempting indoctrination.
211. Please teach evolution and not creationism
212. Well done appendices.
213. This is not the reason for my current comments.
214. I disagree.
- L4 page 79 Again eliminating the word evolution is a direct attempt to water down an accepted and scientifically accurate description of this process. The association of science educators' description of evolution should be here, not this watered-down description in this draft.
215. scientifically accurate description of this process. The association of science educators' description of evolution should be here, not this watered-down description in this draft.
216. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent

explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.

217. I do not think these help much. These standards are still difficult to follow.
218. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
219. See above
220. Please do NOT make changes that remove or downplay references to evolution and the big bang made by Diane Douglas. These changes, made to support a religious agenda by a person who is on the record as supporting "intelligent design" (which is about as scientific as believing that Mickey Mouse controls the weather) would do our students a great disservice by removing or mumbling through references to genuine scientific principles and theories. Because they are supported by rigorous scientific research, data and real-world observation, evolution and the big bang are scientific theories. The "intelligent design" driven Ms. Douglas supports is based on religious beliefs and have no place in public education.
221. these are actually pretty good
222. Misleading
223. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
224. See comments above.
225. Again, I specifically object to the language in section L4, as it directly contradicts the explanation of how "theory" works in the the "Science v Engineering" section of the Appendices.
226. I did not look at appendixes.
227. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
228. Appendixes are always helpful provided the content is updated to include evolution and the Big Bang theory.
229. The present Appendixes are a helpful addition.
230. no comment
231. See previous comments
232. Completely slows down the planning process. Having to cross-reference another document makes preparation painstaking. They are a weak attempt at improving upon the current science standards.
233. I think it is too wordy.
234. They are overwhelming to read. I am overwhelmed with trying to understand all of the changes. This will definitely run new teachers out of the profession.
235. The appendixes are very informative, but in order to understand the standards I need to teach, it should not have to take me a whole different supporting document.
236. It's a helpful reference for clarification.
237. Again, so much information in so many different places. Simplify.
238. I like that they explain the different components of each standard.
239. See comment above
240. The Appendixes are fine.
241. Yes- very helpful in understanding- I almost wonder if it would be best to place them at the beginning as well?
242. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
243. I really just looked at the edits and changes. Having written similar things in the past I know how

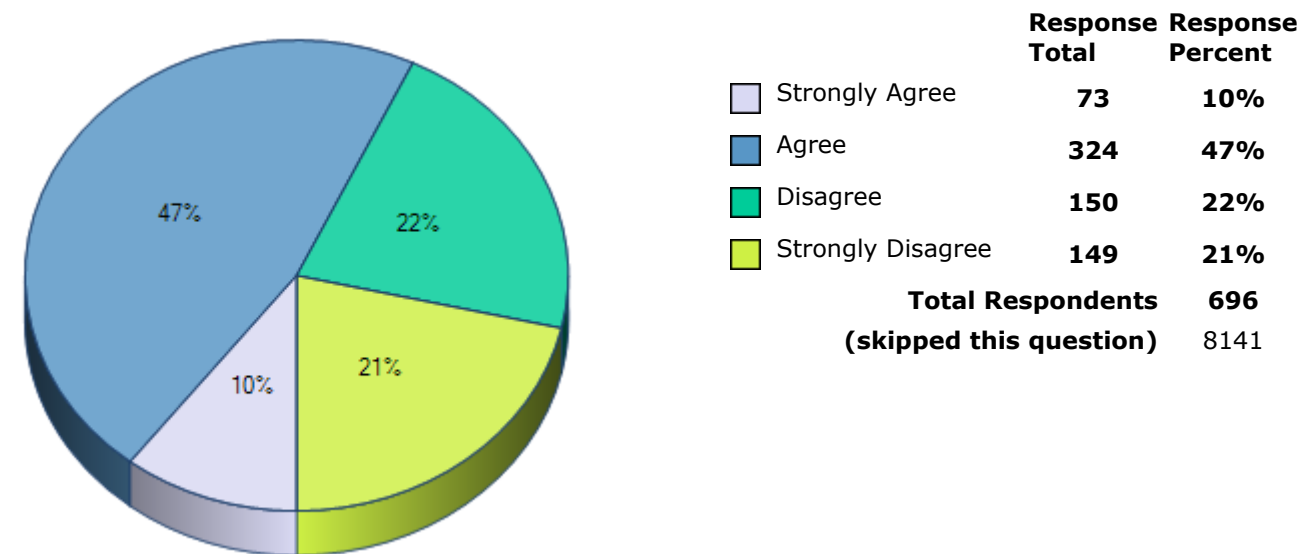


- important appendices really are to someone actually using the document.
244. Appropriate.
245. Teach to facts not fiction. leave your mythology out of the classroom
246. No issues
247. The content of the document is not consistent with the appendices, though.
248. N/A
249. I think these are important details and should probably just be in the intro so readers don't skip over them.
250. I agree with content expert reviewer Peter Rillero's comments about appendices.
251. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
252. These appendices need to be read before reading about the setup. The core ideas information need to be in the introduction.
253. no comment
254. Appendices are adequate.
255. I am glad the other subjects are included. I understand from elementary teachers that it is difficult to include science when the emphasis is on the reading, writing, and math. I believe science can be used as a platform for all those subjects.
256. leave them as they are
257. More information could have included but it suffices.
258. N/A
259. Evolution should be taught, not creationism.
260. However, Science and engineering practices are NOT formerly the scientific method. They are NOT a process.
261. I went to the internet references and didn't see anything that refutes the use of global warming, evolution, or big bang.
262. See previous comments.
263. Appendices are useful.
264. Frankly, I didn't look at the Appendices when I read the DRAFT. Now that you're forcing me to look at them, I'm not crazy about Appendix 5, "Equity & Diversity." I have found, in 60+ years of living, that when you seek to equalize everything, you invariably over-equalize, and those who we perceive as disadvantaged suddenly receive special advantages, to the detriment of the others. Just treat everyone equally and that's the best we can do. Life isn't fair and it's okay that some students will do better than others in science. (Perhaps those that don't do well in science will be good musicians.)
265. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
266. The appendices provide a bit of specificity which the standards lack.
267. These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
268. No comment
269. The wording here, again, has been changed unnecessarily.
270. No religion in school
271. Ditto
272. Detail always helps

- Appendix 4: Interdisciplinary Connections is a more accurate and effective means of sharing cross-curricular connections than the often random and unrelated standards shared in the connections to other academic disciplines sections after each grade level.
- Page 79,
274. Section E1 makes no mention of how human interactions can lead to changes in climate. Section L4: Remove "seeks to make clear the" explains unity and diversity caused by Natural Selection.
275. The appendices are a good supporting document to the standards.
- The appendices do contain helpful information, but I am disappointed that the Core Ideas (adapted from Working With the Big Ideas of Science Education) have been so blatantly changed. What makes the internal reviewers believe that they know more about science education than the experts of this international collaboration? The Core Ideas P4 & L4 (Big Ideas 4 & 10) should be reinstated to their initial form stated in Working With Big Ideas of Science Education.
276. the internal reviewers believe that they know more about science education than the experts of this international collaboration? The Core Ideas P4 & L4 (Big Ideas 4 & 10) should be reinstated to their initial form stated in Working With Big Ideas of Science Education.
277. The appendices are very thorough.
278. I'm not sure how many people will actually read them, but they provide good information. It would be nice to have more guidance on HOW to implement 3D teaching practices
279. keep evolution reject intelligent design
280. No comment
281. N/A
282. Appendices are burdensome and do not cite appropriate peer-reviewed science.

**Total Respondents 282**

**19.** The Kindergarten Science Standards are appropriate for this grade level and complement the other Grades K-2 Science Standards.



**20.** What would you like the working group to consider as they revise the Kindergarten Science Standards?

1. nothing
2. Remove the wording "their associated body parts" isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary.
3. Providing appropriate vocabulary to connect to the standards.
4. Should leave Kindergarten out of science. Let them focus on reading, writing and tying their shoes.

5. N/a
6. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
7. Introducing scientific method early
8. The K standards do not flow into first grade. The K standards are vague compared to the first grade standards. On first grade standards it states that KL2U2.7 concepts were taught however the K standard does not include soil, sand, and rocks.
9. Weather should be moved or at least added to 2nd grade. I think it's good for them to have an introductory discussion/unit on weather, but it needs to come up again and they shouldn't be getting into all the specifics of precipitation.
10. They look good.
11. These are not what the committee created
12. Wait to Test.
13. That Kindergarten students need as much Kinesthetic activity as possible to enrich their learning.
14. No, Kindergartners brains are not developed to evaluate.
15. Some of the revisions are not grade level appropriate. Obtaining and evaluating body systems does not make sense at this level. If we want them to understand that the human body has different systems that have different basic functions, great! Let's re-word it to say that!  
I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.
16. Kindergarten  
Page 9, 21, 33  
Remove last sentence: "Suggestions for key concepts...or maximum content limits."
17. Pages 12, 15, 19, 24, 28, 31, 37, 41, 45  
Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.
18. needs more break down in each standard
19. Definitely agree.
20. Too much room for interpretation. How can they measure whether the students mastered the standards
21. There are too many standards for the Kinder group. They will not have time to cover all of those topics.
22. The standards allow for flexibility for various learner proficiency levels.
23. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
24. Examples of what type of device Kindergarteners would create to extend/improve their senses.
25. The Key concepts should be dropped from every grade level.
26. Same as above - too complicated!!  
The very first kinder standard has become both a life and physical science standard. Additionally, to
27. investigate entails planning and conducting experiments. The language should be refined to reflect the true science/engineering practice.
28. Challenging.
29. Hands on instructions to inspire an inquisitive mind.
30. Funding
31. Because we don't have lots of weather issues in Arizona, I would like to see a rock and mineral standard added to kindergarten.

32. Please provide some examples of text or activity ideas that could be used to teach each standard.
33. I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.
34. Adopt NGSS standards
35. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
36. I believe that standard K.P2U2.1 is not developmentally appropriate that way that it is written, or how I interpret it. I also believe that the key concepts are misleading and should be developed at the district level, reaching from standards to curriculum.
37. Where there were internal changes there needs to be attention paid to the developmental appropriateness. Please re-check
38. no comment
39. n/a
40. No evolution?
41. More hands on activities
42. Lots of standards in PS that seem above k, like sound waves.
43. You are limited only from your willing to teach.
44. Page 11, return to using the word "observe" and add describe (DOK level), instead of the suggested "ask questions about" - this is too informal and not appropriate for a STANDARD of learning.  
Reword to say, "Observe and ask questions..."
45. That is how students formulate their own questions... through observations. They are naturally curious.
46. All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.
47. Do not attempt to deny or water down the concepts of evolution.
48. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
49. Put back in the word "observe". At this age, learning to make proper observations is key.
50. Practical application of science, science experiments. Be very hands on.
51. I couldn't care less about Kindergarten.
52. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
53. Include health standard that includes body awareness
54. Lack of engineering standards and design thinking concepts within the document.
55. Revised text
56. N/A
57. Kindergarten should be a time for learning how to interact with others and behave in school and not be so heavily focused on academic content. Our obsession with getting standards 'mastered' at such a young age is actually counter productive. Look at international research and look into brain mapping studies.
58. Get rid of the "knowing and using science" and key concepts. Integrate more the three dimensions of "A Framework for K-12 Science Education."
- 59.

- I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
60. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
  61. As sent by the 111 science specialists in November 2017 (left unchanged).
  62. The changes are unacceptable.
  63. It is obvious that science teachers and kinder teachers were not around when the green revisions were made.
  64. Needs to go back to review.
  65. We must start to educated all standards taught across the country, starting in the earliest levels of education.
  66. Please consider what is developmentally appropriate for kindergartners and develop their natural curiosity.
  67. I don't know, I'm sorry, I don't teach K!  
This section seems fine, however, I would include more emphasis on "observation". As an educator, scientist, and a father, one thing I am constantly getting my students, colleagues, and child to do is simply observe their surrounding. I think the idea of "observing" and trusting your observation is critical for problem solving and the sooner it starts, the better.
  68. No specific recommendations for this level
  69. I have not read the full draft, so have no comment on this
  70. We should only be covering evolution in school. Creationism should be kept separate from schools.
  71. Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)
  72. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
  73. Allow the students to gather information.
  74. Send the standards back for review.
  75. Explain evolution.
  76. Include Evolution, omit Creationism and "Intelligent Design".
  77. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
  78. Do not include "intelligent design" as part of the option for teaching science. Not supported scientifically.
  79. Refer reply in 20 above.
  80. scrap it
  81. ....
  82. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
  83. Continue to teach evolution. Do not remove it to teach creationism.
  84. Outside my area
  85. Science at this grade level should be competitive to the rest of the nation. It is lacking in quality content and scientific community standards.
  86. Children are never too young to learn science.
  87. I think children could handle higher level science at this age since they are so curious at this age.
  88. Refer to my response to question 17.
  - 89.



Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.

90. The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.

The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.

The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.

91. I only put 'disagree' because they seem overly ambitious given the teacher training and resources available at this level.

92. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.

93. Teach proper evolution

94. Critical thinking; must know that there something it is called Science

95. Evolution must continue to be taught.

96. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.

97. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.

98. I trust the experts who wrote these standards

99. Kindergarten children are generally 5-6 years old. They do not need to know how to make predictions and it is ridiculous to put standards for children that are clearly beyond the scope of most toddlers. The concept that there are only 5 senses is archaic and should be removed. Many respected scientists agree that there are more than 5 senses.

100. Introduce more scientific concepts. Introduce introductory scientific theory and philosophy.

101. You can do much more here.

102. Evolution

103. Again, creationism has no place in sound science teaching. It is retrogressive and intellectually suspect.

104. All standards need to be included.

105. No comment.

106. Include Kindergarten teachers in the working group.

107. In kindergarten children should already be experimenting and developing a love of science. They need to learn that science begins with curiosity. There should be flexibility to allow students to drive their own investigation of something they are curious about.

108. No form of creationism should be taught in public schools period. It is unconstitutional & will waste more tax payer \$ when it inevitably ends up going to court & gets shot down.

109. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.

110. Adding and maintaining teaching Evolution needs to be continued.

111. I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!

112. Evolution. Get the idea?

113. Narrow the scope. The educational focus in Kindergarten should be on reading, writing, and math while making connects through those disciplines to scientific ideas.
114. Teach Science and facts in Schools not faith and religion.
115. N/A
116. No comment.
117. Fix evolution standards.
118. See comment #9
119. I have no issues. Seems appropriate.
120. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
121. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.
122. Please do not muddy the language regarding evolution  
Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
123. Please don't avoid education on evolution.
124. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
125. Teach Science not religion
126. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
127. Revert all of Diane Douglas's changes.  
If the state allows teaching creationism, they will also have to teach other religion's creation myths,
128. such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
129. No much difference between 2014 and current  
Kids learn the most and the fastest. Don't take it easy on them. I learned multiplication in
130. kindergarten...then again...I came from another country. As long as you do it in a fun way than the kids will love it.
131. It's hard to compare grades the way this is constructed. I didn't notice until I studied the old version and saw that the differences in grades are immediately apparent on the charts.
132. It's great that the students will learn about health! They also should learn a little about the environment that supports them and how to interact with it
133. The word "observe" is consistently replaced by "ask questions about", it would be stronger to say "observe and ask questions about".
134. Bring back the word "evolution."
135. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
136. hands on involvement in experiment and founding principals of observation and hypothesis and experimentation
137. Removal/replacement/minimizing evolution is completely unacceptable.
138. Actual science
139. Remove all religious references.
140. Consistently misses the importance of asking questions and questioning theories.
141. Check over all cases of removal of scientific theories.
142. Strengthen the Standards. Eliminate any inkling about creationism or intelligent design - these

- teachings are for (some) churches.
143. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
144. The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.
145. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
146. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
147. The edits in this section range from laughable to egregious in relation to scientific knowledge and practice. For example, on p. 10: light and sound are not "impacted by the senses; five senses obtain a range of data from the natural world, not only light, sound, and vibrations.
148. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
149. Evolution must be introduced at the kindergarten level as it is a basic concept in science.
150. At every grade level I see a structural problem with organization and connections. Specifically, life sciences and earth sciences are being misrepresented, or are lacking proper depth. The anecdotal examples given in the "key concepts" column will leave many teachers just implementing a snapshot of random material instead of embedding and utilizing the understanding and applications of science as a means to inspire and drive learning in other subject areas.
151. Original language should remain
152. Teach evolution. Evolution is science.
153. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
154. Make science dynamic and exploratory
155. no
156. I would like to see the working group think about the standards from the point of view of a kindergartner through second grader. The standards tend to reflect the idea of beginning with what we want students to know when they graduate and then working backwards, instead of working from the beginning up.
157. No comment
158. Teaching accepted scientific theories CANNOT be started too young.
159. Only SCIENCE in Science class!
160. The kids are 5!!!! And the teachers are not science teachers.
161. Actual and complete science education
162. Get rid of "intelligent design." Restore references to evolution.
163. I'm not a kindergarten teacher.
164. Not utilize language in re Darwinism, natural selection or evolution.
165. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
166. Don't revise.
167. Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
168. Scientific standards should be based on scientific research and nothing else. Replacing and watering

down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.

169. 7. Page 9, 2nd paragraph – see comment 19 - #2.

170. I have already commented on several sections, another change is the insertion of "positively or negatively" to discussing human impact on species extinction. Except for domestic examples like cows, pigs and chickens or pests like cockroaches and mice, I am unaware of a case where humans have positively impacted species abundance, so why is this addition necessary?

171. As far as I know.

172. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.

173. A kindergartner's level of understanding of the Theory of Evolution.

Without ADE additions, this would be a strongly agree.

Connections to other academic disciplines.

- Remove entirely from the document. This belongs in a support document or curriculum adopted locally.
- These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board.
- Additionally, many of the connections cited don't actually align to the standards within the grade level.

Key concepts Column

- What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level.
  - Remove they key concepts column from the document.
  - If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards.
- 174.
- Key concepts, if included must represent concepts from all three dimensions, and not just the content of science.
  - Below is an example for K.E1U1.3 Follow this process for each of the kindergarten standards, not just the example below.

Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions:

- Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time.
- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.
- Scientists look for patterns and order when making observations about the world.
- Use observations to describe patterns in the natural world in order to answer scientific questions.
- Ask questions based on observations to find more information about the natural world.

175. Evolution

176. Respect the Constitution of the United States of America and keep religion out of government!

177. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.

178. How about grade-appropriateness?

179. There should be more emphasis on the general scientific method and critical thinking as well. This is the core of all science and the first skill that should be taught.

180. Family wishes.

181. None

182. If one would consider what five year olds already know and can do, the standards are not nearly rigorous enough nor respectful of their intelligence and abilities.

183. Please teach evolution and not creationism

184. This will form the base for future scientists.

185. SCIENTIFIC THEORY MUST BE TAUGHT
186. Allow creation as part of the science standards
187. Teach evolution
188. This not the reason for my current comments.
189. I would advise the working group to not make any revisions to Kindergarten 2018 Draft.
190. Continue to teach evolution to the grade levels that learned before.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
191. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
192. Actually, no comment. They appear to be fine overall.
193. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
194. Again- this thing does not read well. I'm sure any adequate teacher can make science interesting to students. What's not to like?
195. Stick to standard grade level science focused wording  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
196. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
197. See comments above.
198. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
199. No comment.
200. Keeping any mention of religion out of them.
201. no comment
202. Yes, see previous comments
203. Stop revising the old standard
204. Teach CREATIONISM along with the other junk  
I'm afraid I'm running out of time to fill this out- I received a 5-minute warning about 4 minutes ago!
205. As a general comment, I would like the working group to consider how our standards compare to those adopted by other states and countries -- will our students, upon mastering these standards, have as strong a foundation as students in other parts of the country and world?
206. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.
207. Keep the standards  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
208. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
209. The current standards are.
210. This is the most important area to apply hands on learning. Kids this age are naturally curious; teachers need the support to allow the kids to learn in a way that makes sense to them.
211. teach science not religious dogma
212. No issues
- 213.

214. There is a sentence saying "light and sound are impacted by senses". This is obviously not true, light and sound impact our senses and the way we perceive the world - our senses don't do much to light and sound.
215. Not able to access - 404 error  
Remove key concepts.
216. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
217. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
218. The principle of critical thinking, questioning ideologies.
219. Establishing scientific curiosity is important. The kindergarten section appears to do that.
220. none
221. Too complicated for Kindergarten.
222. leave them as they are
223. This is a new and different way of teaching science and teachers will need training, materials, and space.
224. The working group has done a fine job in explaining what students are expected to experience in science at the Kindergarten level.
225. Does not need any non scientific hypothesis such as creationism
226. See 19
227. C
228. Nothing. I don't think it needs to be changed.
229. Evolution should be taught, not creationism.
230. The proposed key concepts column should be rejected. Where is engineering?
231. Adopt NGSS!  
Adding the words five and body parts in P1 change a physical science standard into a life science standard.
232. Also, there are standards where there are no learning progressions listed in the Working With Big Ideas in Science and there are no standards where there are learning progressions.
233. Keep the science standards we already have.
234. See previous comments.
235. Keep teaching science only. Not religious science.
236. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
237. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
238. In L4: Replace "seeks to make clear" with "explains".
239. Removal of the word "observe" is puzzling
240. body functions at a K level are not appropriate
241. The constitution the constitution
242. Ditto
243. See my comments in no. 15.



244. What scientists and educators are on the working group? What are their disciplines and what level of education do they each have? This is a thinly veiled attempt to dumb down Arizona's students. To what purpose?
245. Creating age appropriate standards that align to national research based materials such as the document called, " Working with Big Ideas of Science Eduaction".
246. It's good.
247. Nothing
248. Make it developemntally appropriate
249. keep evolution reject intelligent design
250. Young children are natural scientists and the standards here are a bit limiting - they love dinosaurs and space - we should capitalize on that.
251. N/A
252. n/a
253. N/A
254. Page 9: We are NOT renaming the scientific method as science and engineering practices so the " (formerly the scientific method)" NEEDS to go. That particular edit is particularly embarrassing.
255. I am not an educator and therefore have little idea of what each grades' standards should be. However the educators do know this and should be the source of the inkormation not politicians.

**Total Respondents 255**

**21.** What would you like the working group to consider as they revise the Physical Science Standards in the Kindergarten Science Standards?

1. nothing  
Remove the wording "their associated body parts" isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary.
2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
3. Include the idea of energy that we use in our everyday lives.
4. N/a
5. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
6. We would like to add with prompting and support to many of these standards like in our LAS standards
7. No suggestions.
8. These are not what the committee created
9. Wait to Test.
10. What I have mentioned in number 23.
11. Nothing  
Page 10  
Remove Key Concepts Column
12. Under K.P2U2.1 remove 'five' and 'their associated body parts' - this is Physical Science, not Life Science.
13. I like the critical thinking part, teachers will have teach their K students to do it
14. Should include observations

15. No revisions needed.
16. Provide a measure that teachers can use to see if they have mastered this standard
17. None
18. Simplification.
19. Hands on instructions to inspire an inquisitive mind.
20. Funding
21. by adding mineral and rocks to this grade, you also have a link to physical standards: we use our senses to identify rocks and minerals
22. Needs some revision about how to teach vibrations and how to "design a tool to extend the senses"; that is not clear on what "extending the senses" means.
23. Adopt NGSS standards
24. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
25. I am just wondering if the wording of K.P2U2.1 changes this to a Life standard?
26. no comment
27. n/a
28. Redo
29. Simplify!
30. Consider where some of the content shows up in NGSS and then keep it there.
31. The world where we live. Not just your classroom.
32. Well done.  
I would like more of a focus on the scientific method. Natural sciences were called Natural philosophy for a reason where philosophy refers to the love of knowledge and/or truth. This is a core concept which needs to be there from the beginning. How do we know that something is true? Please watch this <https://www.youtube.com/watch?v=Yk5IWzTfWeM> it is a great explanation and entitled "how do we know what is true".
33. Do not attempt to deny or water down the concepts of evolution.
34. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
35. This section is good as is.
36. see above.
37. I couldn't care less about Kindergarten.
38. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
39. adding design thinking to address K.P2U3.2 to build a foundation for this type of scientific thinking for students.
40. Revised text
41. Due to changes made during the internal review, K.P2U2.1 is no longer a physical science standard but a life science standard.
42. Due to changes made during the internal review, K.P2U2.1 is no longer a physical science standard but a life science standard.

44. N/A
45. The physical science standards are actually more life science standards about human body senses. Nationally at Kindergarten, students are exploring forces of pushes and pulling.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
46. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
47. The changes are unacceptable.
48. Consider that these are 6 year olds and the information needs to at their level. They also need to hear the appropriate science language, not the language of a businessperson or politician.
49. Needs to go back to review.
50. Keep religious beliefs out of science standards. Children should be introduced to the principles of objective science at the earliest age.
51. Evolution and climate change are commonly adopted science standards. They must not be left out.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
- 52.
53. Emphasis on observation!
54. I have not read the full draft, so have no comment on this
55. We should only be covering evolution in school. Creationism should be kept separate from schools.  
The focus of K.P2.U2.1 is a life science standard and not a physical science standard. This standard as written focuses on 3 senses (touch, sight, hearing - not taste/smell).
56. If the standard is about the senses then it maybe better suited in a health standard and not science.  
Possible solutions: Plan and conduct an investigation to collect evidence that vibrating materials can make sound and that sound can make materials vibrate. Make observations to construct an explanation that objects can be seen only when illuminated.
57. Send the standards back for review.
58. Explain evolution.
59. Include Evolution, omit Creationism and "Intelligent Design".
60. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
61. Developmentally appropriate amounts of standards so students have necessary amounts of recess and learning through play
62. Refer reply in 20 above.
63. dinosaurs
64. Where is the physics??
65. ....
66. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
67. Continue to teach evolution. Do not remove it to teach creationism.
68. Outside my area  
Science at this grade level should be competitive to the rest of the nation as well as internationally. It is lacking in quality content and scientific community standards. I would like to see future STEM careers considered starting at the beginning of these curriculum grades.
- 69.

70. Add evolution. Even young children can get the concept.
71. All children should have at the minimum 30 minutes PE daily.
72. Refer to my response to question 17.
73. Since the E&SS standards talk about precipitation, I'd like to see something about kindergarten students being able to identify three states of matter: solid, liquid, gas.
74. Teach proper evolution
75. scientific method
76. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
77. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
78. Make it fun!! Make it exciting. Make it something that children will thrive on.
79. Ambivalent.
80. Evolution
81. All standards need to be included.
82. No comment.
83. Science.
84. For all science standards, the working group should consider if the standards are developmentally appropriate for the age group and if they are based on current science practices and scientific knowledge. There is no room for non-evidentiary (i.e. religious) belief in science. How do classroom teachers feel about the teachability of these standards?
85. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
86. Adding and maintaining teaching Evolution needs to be continued.
87. We have moved all of our other standards up so that what used to be first grade standards are now in Kindergarten but in science. The five senses are something students learn through out life and are not needed in these standards. This si something that is taught in Preschool these days.
88. I could say evolution again, you know.
89. Teach Science and facts in Schools not faith and religion.
90. N/A
91. No comment.
92. Fix evolution standards.
93. See comment #9
94. N/a
95. Only facts based on repeatable scientific tests.
96. More observation and sense of wonder.
97. Please do not muddy the language regarding evolution
98. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
99. Teaching Science not religion
100. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
101. Revert all of Diane Douglas's changes.

102. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
103. nothing
104. No intelligent design.
105. They also should learn a little about the environment that supports them and how to interact with it, this is critical! We only have one plane, and humans are destroying it!
106. In this section there is the statement "light and sound are impacted by the senses". My understanding is that it is the other way around.
107. Ditto
108. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
109. understanding earth science and space science principals like planetary bodies and the functions of natural cycles  
K.P2U2.1 - The addition of "five" for five senses and the addition of "their associated body parts" is
110. confusing. A better revision might be "Investigate how the human body senses light, sound and vibrations when when they come from far away."
111. Removal/replacement/minimizing evolution is completely unacceptable.
112. A better working understanding of the world around then and its origins
113. Remove all religious references.
114. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.  
"Investigate how the five senses and their associated body parts can detect light, sound, and vibrations even when they come from far away; use the collected evidence to develop and support an explanation."
115. This standard is awkwardly written. Our sense of smell, for example, does not detect light, sound or vibrations from far away.
116. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
117. Get a scientific expert to rewrite the content or undo the edits.
118. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
119. Original language should remain
120. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
121. no
122. No comment
123. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
124. Only SCIENCE in Science class!
125. The teachers are not science teachers.
126. See above
127. Get rid of "intelligent design." Restore references to evolution.

130. I am not a kindergarten teacher.  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or
131. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
132. Don't revise.  
Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the
133. replication of self copying dna in science labs and modern genetic engineering efforts is wrong.  
Period. Evolution through natural selection over millenia is a scientific fact.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering
134. down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
135. Not reviewed.
136. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
137. A kindergartner's level of understanding of the Theory of Evolution.
138. Standards 1 is no longer a physical science standard and no longer makes sense due to the ADE changes.
139. Evolution
140. Teach our children science and not nonsense.
141. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
142. No comment as I don't believe these standards are fixable.
143. They can focus elsewhere with their improvements.  
They should be considering the standards set for fifth grade. All the way through, there is a "dumbing
144. down" of science, which I fail to understand. Students understand scientific concepts much more easily than most adults, when presented early and often.
145. Please teach evolution and not creationism
146. More weather and mapping!
147. SCIENTIFIC THEORY MUST BE TAUGHT
148. Review changes that were made.
149. Teach evolution
150. This not the reason for my current comments.
151. I would advise the working group to not make any revisions to the Physical Science Standards in the Kindergarten 2018 Draft Science Standards.
152. No comment.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
153. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
154. No comment.
155. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs.
156. It's raking away our liberty.
157. not enough detail



158. Stick to facts  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
159. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
160. See comments above.
161. Stick to scientific fact not theoretical religious doctrine.
162. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
163. No comment.
164. Include human physical anatomy.
165. no comment
166. See previous comments
167. See comment above
168. Teach creationism
169. Keep the standards  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
170. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
171. do not revise.
172. Work in ways for the kids to get messy, learn about scientific concepts that are meaningful in their own lives.  
You have put out this ridiculous document that mirrors what an educator may be looking at. Not what the public needs other than your controversial wording changes to the Physical Science portion of this
173. lengthy draft.  
You are sure to lose people with this lengthy questionnaire that does not address the real issue at this time!
174. teach science not religious dogma
175. No issues  
Remove key concepts.
176. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
177. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
178. Learning about hypotheses and experiments used to test them.
179. Kindergarten physical science standards are adequate.
180. none
181. no
182. <https://www.nextgenscience.org/>
183. The working group's physical science standards are broad enough and allow students to explore and discover.
184. Does not need any non scientific hypothesis such as creationism
185. See 19
186. Consider how to avoid having Diane Douglas ruin their work product
187. More science based data supporting evolution. Anything else would only be confusing and should not be introduced until high school.

188. include something about burning bushes
189. Evolution should be taught, not creationism.
190. K.P2U2.1 Is a life science standard, not a physical science standard.
191. Adopt NGSS!
192. Framework discusses matter as different substance, heating and cooling, pushes and pulls, effects of the sun on the Earth's surface.
193. See previous comments.
194. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
195. More recess.
196. There are more than five senses
197. magnets
198. The constitution
199. Ditto  
The physical science standards relate solely to senses which are linked to parts of the body; therefore, they are life science standards. That means there are not physical science standards in k as currently proposed. The physical science standards should include motion standards as they relate to sound and light as well as how objects move as this is important as a foundation for grade 1 physical science standards.
200. currently proposed. The physical science standards should include motion standards as they relate to sound and light as well as how objects move as this is important as a foundation for grade 1 physical science standards.  
Please remove the standards K.P2U2.1 and K.P2U3.2 as there is no clear learning progression and they are developmentally inappropriate. If you look at the document, "Working with Big Ideas of Science Education" you will see this clearly communicated.
201. they are developmentally inappropriate. If you look at the document, "Working with Big Ideas of Science Education" you will see this clearly communicated.
202. It's good.
203. No
204. Make it developmentally appropriate
205. keep evolution reject intelligent design
206. include evolution as science
207. Same as above
208. N/A
209. n/a
210. N/A  
K.P2U2.1: This standard is vague and poorly written.
211. e.g. can you smell light (standard says students investigate how the five senses detect light)  
Also, at what level of understanding is the explanation meant to be?
212. Reality of Big Bang.

**Total Respondents 212**

**22.** What would you like the working group to consider as they revise the Earth and Space Science Standards in the Kindergarten Science Standards?

1. nothing
2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
3. Make sure to include the idea of climate change.

4. N/a
5. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
6. Make sure you are using consistent verbiage throughout especially in the key concept areas (I.E 4th grade Key concepts)
7. No suggestions.
8. These are not what the committee created
9. Wait to Test.
10. Nothing in particular.
11. Nothing
12. Remove Key Concepts Column
13. No revisions needed.
14. great
15. None
16. Simplification.
17. Hands on instructions to inspire an inquisitive mind.
18. Funding
19. if you add rocks/minerals to this grade, you have a way to link the life science to earth science: living vs. non-living.
20. Looks great!
21. Adopt NGSS standards
22. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
23. I think the Earth and Space Science Standards look good.
24. Kindergarten students can not plan out an investigation- return to original- Observe, record and ask questions.
25. no comment
26. n/a
27. Redo
28. Simllify
29. The same.
30. Include reading and preparing for weather forecasts.
31. Do not attempt to deny or water down the concepts of evolution.
32. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will posses the knowledge they have the right to recieve from their Education department. Thank you.
- 33.
34. This section is good as is.
35. see above

36. I couldn't care less about Kindergarten.
37. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
38. N/A
39. Revised text
40. N/A
41. I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.  
I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
42. Stick to actual science and stop dumbing down our children!
43. Consider that these are 6 year olds and the information needs to at their level. They also need to hear the appropriate science language, not the language of a businessperson or politician.
44. Needs to go back to review.
45. Keep religious beliefs out of science standards.
46. Climate change is a crucial concept that should be taught to all kindergarten students.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
47. Emphasis on observation!
48. NO teaching of "intelligent design" (ie creationism) in any classroom.
49. We should only be covering evolution in school. Creationism should be kept separate from schools.
50. some mythological alien did not make the sky blue, explain with science, as a parent i did along with math and basic earth science.
51. Send the standards back for review.
52. Explain evolution.
53. Include Evolution (where relevant), omit Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
54. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
55. Refer reply in 20 above.
56. ....
57. It is impossible to understand geology without a basic understanding of evolution.
58. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
59. Continue to teach evolution. Do not remove it to teach creationism.
60. Evolution!
61. Outside my area

64. Science at this grade level should be competitive to the rest of the nation as well as internationally. It is lacking in quality content and scientific community standards. I would like to see future STEM careers considered starting at the beginning of these curriculum grades.
65. Make them better, not worse.
66. Teach evolution all other is pseudo-science
67. Refer to my response to question 17.
68. Specific teachings on the big bang theory should be instituted.
69. Teach proper evolution
70. scientific method
71. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.  
Nothing should be taught within or alongside science that does not have the same factual basis that
72. all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
73. Make it fun!! Make it exciting. Make it something that children will thrive on. Also make it something that a child can relate to.
74. Ambivalent.
75. Evolution
76. All standards need to be included.
77. No comment.
78. Science.
79. See above.
80. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
81. Adding and maintaining teaching Evolution needs to be continued.
82. We should include an investigation or something that would include the students studying and making conclusions. "Plan and conduct an investigation to determine the effect of sunlight on Earth's surface"
83. How about some anthropogenic climate change too?
84. Teach Science and facts in Schools not faith and religion.
85. N/A
86. No comment.
87. Fix evolution standards.
88. See comment #9
89. N/a
90. Only facts based on repeatable scientific tests.
91. More sense of wonder.
92. Please do not muddy the language regarding evolution
93. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
94. Teach Science, not religion
95. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
96. Revert all of Diane Douglas's changes.

97. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
98. nothing
99. Ditto
100. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
101. providing hard science concepts with strong reference to robust science vocabulary
102. Removal/replacement/minimizing evolution is completely unacceptable.
103. Same as above except on a universal level
104. Remove all religious references.
105. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
106. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
107. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
108. Get a scientific expert to rewrite the content or undo the edits.
109. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
110. Clearly include teaching the concept of evolution.
111. Original language should remain
112. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
113. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
114. no
115. No comment
116. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
117. Only SCIENCE in Science class!
118. the teachers are not science teachers.
119. Climate change
120. Not a kindergarten teacher.  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
121. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
122. Don't revise.  
Any change in curriculum de-emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
123. replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
124. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
125. Include climate change



126. They need to learn about the damaging effects of fossil fuels on the environment.
127. Page 11, K.E1U1.3 and 4: I am happy with the addition of "and ask questions." I just hope that this was not added to encourage students to question the science concepts related to their observations.
128. Not reviewed.
129. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
130. A kindergartner's level of understanding of the Theory of Evolution.
131. Standard 4: Influence is an inappropriate term. Impact was accurate
132. Evolution and climate change
133. Teach our children science and not nonsense.
134. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
135. No comment as I don't believe these standards are fixable.
136. They can focus elsewhere with their improvements.  
Consider incorporating critical thinking skills that accompany deep learning, and design standards that
137. incorporate students innovating with the knowledge of the standard's concept(s) to develop solutions to scenarios that are real to them.
138. Please teach evolution and not creationism
139. Creationalism and Intelligent Design
140. SCIENTIFIC THEORY MUST BE TAUGHT
141. Teach evolution
142. This not the reason for my current comments.
143. I would advise the working group to not make any revisions to the Earth and Space Science Standards in the Kindergarten 2018 Draft Science Standards.
144. Keep religion out of science class.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
145. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
146. No comment.
147. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start
148. up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
149. not enough detail
150. Verifiable, scientific facts  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
151. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
152. See comments above.
153. Stick to scientific fact not theoretical religious doctrine.
154. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
155. No comment.

156. How the earth was formed millions and millions of years ago.
157. no comment
158. See previous comments
159. Stop your effort and go home
160. Teach creationism
161. Keep the standards
162. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
163. do not revise.
164. 5 year olds can undertand how they can help to improve our planet. Let's emphasize that more .
165. teach science not religious dogma
166. No issues  
Remove key concepts.
167. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
168. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
169. Learning about plate tectonics and continental drift of the earth's physiognomies in an easily accessible way.
170. Kindergarten earth and space scient standards are adequate.
171. none
172. <https://www.nextgenscience.org/>  
The Earth Science standards are appropriate. But note: I typed "Earth Science". What about the Space portion? Nothing in the Earth Science and Space Standards are specific to Kindergarten. An example might be "Obtain, evaluate, and communicate information about space bodies near the earth (e.g. the moon, the stars, the sun, the solar system)".
173. Does not need any non scientific hypothesis such as creationism
174. See 19
175. Consider how to avoid having t Diane Douglas ruin their work product
176. Keep the focus on what the data supports.
177. don't forget the earth is flat.
178. Evolution should be taught, not creationism.
179. Internal review changes to KE1U1.4 should be rejected. Climate impacts organisms. It does not influence them.
180. Adopt NGSS!
181. Key concepts are vocabulary terms. Either rename them as such or write them as concepts. We want students to move beyond memorizing vocabulary to understanding concepts.
182. At no time should 'conclusions' or 'theories' be presented that are not arrived-at via use of the Scientific Method.
183. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
184. See previous comments.
185. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
- 186.

187. These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
188. Changing "impact" to "influence" weakens the language regarding weather patterns
189. solar system
190. The constitution the consyi
191. The constitution
192. Include additional standards that link to living things and their environments as this is focused on in the life science standards  
Do not water down the science standards that tell the true story of earth and space even at this level!
193. This is the foundation level that all students must build on! keep the information in line with actual scientific facts!
194. It's good.
195. NO
196. Make it developemntally appropriate
197. keep evolution; reject intelligent design
198. include evolution as science
199. Same as above
200. N/A
201. N/A  
K.E1U1.4  
Key concepts: Why not be more focused on what students observe out their own windows? I would like to see precipitation patterns included and more desert ecology.  
The wording of the standard is awkward: How do you ask questions seasonal weather patterns?  
Make sure list structure is consistent.

**Total Respondents 202**

**23.** What would you like the working group to consider as they revise the Life Science Standards in the Kindergarten Science Standards?

1. nothing
2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
3. Evolution should be front and center from an early stage in life. It promotes logical thinking skills.
4. N/a
5. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
6. I would prefer if age appropriate sex ed started in kindergarten, but that seems to be a different subject than just life science.  
I would like to add something in earth and space sciences about how the earth rotates around the sun and a shadow is dependent on the location of the sun to an object. Also add in K.L2U2.6 classifying and sorting is is such an important skill that young learners need to practice. Also properties and states of matter should be introduced in kindergarten. sink and float experiments are appropriate and so fascinating to young learners. Kindergarten is so experiential they need a little bit of everything so 1.P3U1.3 can be broken down into 2 pieces so kindergarten students can understand that objects can be moved with out touching them.
- 7.
8. No suggestions.

9. These are not what the committee created
10. Wait to Test.
11. Nothing in particular.
12. Nothing  
Obtaining and evaluating body systems does not make sense at this level. If we want them to understand that the human body has different systems that have different basic functions, great!
13. Let's re-word it to say that!  
  
Each standard must be age-appropriate, the revisions make them so they are not.  
Page 11  
Remove Key Concepts Column
14. Remove K.L1U1.5 - how will students "Obtain" how the human body has different systems that carry out life processes? Also, since it is in green, the teacher's did not indicate that this is a standard that should be taught at the Kindergarten level.
15. I do not feel that these standards are appropriate for this grade level.
16. maybe too much
17. Move the body systems standard to a higher grade level in order to give the Kindergarteners a realistic load.
18. Simplification.
19. Hands on instructions to inspire an inquisitive mind.
20. Funding
21. Looks great!
22. Adopt NGSS standards
23. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.  
K.L1U1.5 - again this standard seems to reach beyond the conceptual level of a kindergartner  
  
What is meant by obtain here? What are they to obtain? Investigate might be a more appropriate word for what I think the outcome is supposed to be.
24. Key Concepts for K.L4U2.7 - how is farming related to specialized structures found on plants and animals
25. K.L2U2.6 take out "properties of" as it is redundant. Living and non-living things do not have properties but rather characteristics. Does not need this additional language.
26. Evolution section is weak and watered down. It needs to be strengthened.
27. n/a
28. Redo
29. Simplify  
I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.
30. Do not attempt to deny or water down the concepts of evolution.
31. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
32. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific

method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.

34. Put back in the word "observe". At this age, learning to make proper observations is key.
35. Keep religion out of it!!!!
36. I couldn't care less about Kindergarten.
37. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
38. N/A
39. N/A
40. I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.  
I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
41. Stick to actual science and stop dumbing down our children!
42. Consider that these are 6 year olds and the information needs to be at their level. They also need to hear the appropriate science language, not the language of a businessperson or politician.
43. Needs to go back to review.
44. Keep religious beliefs out of science standards.
45. Climate change and evolution must be adopted as standard curriculum.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if students are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science courses such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
46. See previous comments on the treatment of evolutionary biology.
47. Emphasis on observation!
48. I have not read the full draft, so have no comment on this
49. We should only be covering evolution in school. Creationism should be kept separate from schools.  
K.11U1.5 Human body systems is not a part of the Framework or the Working with Big Ideas for this standard. Delete. This should be included in Health Standards.
50. K.L2.U2.6 - Delete properties, insert characteristics. Living and non living organisms do not have properties; they have characteristics.
51. Don't eliminate references to evolution, as it's necessary to understand life sciences.
52. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
53. Evolution must be taught.
54. Send the standards back for review.
55. Explain evolution.
56. Include Evolution, omit ANY MENTION OF Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earth's problems.
57. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earth's problems.

59. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.  
Sex education should begin at this age including awareness of other's (LGBTQ ect) and to remove stigma of sex and masturbation. Research shows that toddlers and people of all ages masturbate and repressing this and sexual orientation and gender identity has a strong correlation to mental health issues in adults.
- 60.
61. Refer reply in 20 above.
62. ....
63. Children in Kindergarten should be introduced to basic concepts in evolutionary theory.
64. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
65. Continue to teach evolution. Do not remove it to teach creationism.
66. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations.
67. Evolution is all there is.
68. Children love these subjects. Make it interesting.
69. Refer to my response to question 17.
70. Darwin please.  
K.L1U1.5 It says 'Obtain, evaluate, and communicate how the human body has different systems that carry out life processes.' - this wording leaves some to be desired, and we are not shown what previous wording was. You presumably mean 'obtain information about'? What are kindergardeners supposed to do to 'evaluate'? Are they evaluating the information about the human body, or evaluating the systems of the human body? What value is being measured here?
71. K.L2U2.6 'air, food, water, energy' are not 'properties of non-living' things. This needs at least rephrasing but also clarification. Air is a non-living thing, but what are kids now learning about how it is different from living things?  
K.L4U2.7 Key concepts listed bear no relationship to the topic of the standard.  
K.L2U2.6 and K.L4U2.7 both remove the term 'observe' - why? Observation, particularly careful, thorough observation, is one of the most important skills as scientist and anyone who seeks to understand and evaluate evidence. Information does not come from asking questions and explaining alone - information is actually gathered by careful observations (or researching sources).  
Specifically Charles Darwins theory of evolution must be taught. It forms the foundation of life science scientific inquiry. By not teaching Darwins theory of evolution you diminish the quality of education for our children.
72. Strengthen the teaching of evolution and global change to reflect the science of these subjects.
73. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
74. Teach proper evolution
75. scientific method critical for those inclined to medicine, biology
76. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
77. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
78. STOP calling Evolution a theory. It is not, and it is wrong to spout such nonsense.
79. STOP thinking that everything has both a positive and negative effect - those are often subjective concepts and should be removed from the document.
80. Ambivalent.
81. Introduce evolution



82. L4
83. Evolution
84. As above.
85. All standards need to be included.
86. Evolution as scientific fact instead of Creationism needs to be added back.
87. The science of evolution.
88. See above.
89. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
90. Adding and maintaining teaching Evolution needs to be continued.  
Hey here is a thought: Let's talk about climate change! "Communicate solutions that will reduce the impact of humans on living organisms and non-living things in the local environment."
91. Actual SCIENCE would help. NOT RELIGION.
92. Teach Science and facts in Schools not faith and religion.
93. N/A
94. No comment.
95. Fix evolution standards.
96. See comment #9
97. See first comment
98. Pure foolishness
99. N/a
100. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
101. Only facts based on repeatable scientific tests.
102. As I mentioned in Question 15, I would like to see changes made to the way evolution is described in the Draft
103. Please do not muddy the language regarding evolution  
Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
104. Please don't avoid education on evolution.
105. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
106. Teach Evolution, not Creationism
107. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
108. Revert all of Diane Douglas's changes.
109. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
110. nothing
111. They need to start learning about where they and everything came from, via evolution

113. Ditto
114. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
115. making certain children are reading secular science text and story books not being led down mythological fairy paths  
K.L1U1.5 - The wording is confusing because there is no noun associated with the words "obtain, evaluate, and communicate." A suggested revision would be "Obtain, evaluate, and communicate information about human body systems carry out life processes"
116. K.L1U2.6 - "properties of living and nonliving things" should be changed to "characteristics" of living and nonliving things.
117. Stated above.
118. Put evolution back in, it is science.
119. Removal/replacement/minimizing evolution is completely unacceptable.
120. The first standard of the life science is extremely vague with little direction. The language seems developmentally inappropriate and doesn't have much guidance for teachers.
121. See above
122. Remove all religious references.
123. Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.
124. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.  
"Obtain, evaluate, and communicate how the human body has different systems that carry out life processes."
125. A kindergartner evaluating how the human body has different systems that carry out life processes is not developmentally appropriate.
126. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
127. Get a scientific expert to rewrite the content or undo the edits.
128. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.  
This applies to the "Distribution of K-2 standards" - page 20:  
" L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms."  
This is imprecise. In each section this should read "The study of evolution seeks to demonstrate..."  
First, evolution is an established scientific theory.  
A scientific theory differs from the "street" use of theory, which indicates a "guess" about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.  
Two things distinguish evolution as a "scientific theory" from the more general use of "theory." First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven.  
Thus it is the STUDY of evolution – mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to "test" the underlying theory) – that have provided evidence of "the unity and diversity of living and extinct organisms."
129. Clearly include teaching the concept of evolution.
130. Original language should remain

133. Teach evolution. Evolution is science.
134. We need to start teaching children about all aspects of life including evolution from the very beginning.
135. No comment
136. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
137. Only SCIENCE in Science class!
138. The teachers are not science teachers.
139. Environmental studies should include information regarding human impact.
140. Evolution
141. Get rid of "intelligent design." Restore references to evolution.
142. Not a kindergarten teacher
143. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
144. Don't revise.  
Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
146. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
147. Evolution should be included
148. As far as I know, they are OK.
149. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
150. A kindergartner's level of understanding of the Theory of Evolution.
151. Evolution
152. Teach our children science and not nonsense.
153. That intelligent Design is just one of several approaches to Life Science, and not the exclusive nor irrefutable means to explain development of any forms of life.
154. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
155. No comment as I don't believe these standards are fixable.
156. They can focus elsewhere with their improvements.  
Consider incorporating critical thinking skills that accompany deep learning, and design standards that
157. incorporate students innovating with the knowledge of the standard's concept(s) to develop solutions to scenarios that are real to them.
158. Please teach evolution and not creationism
159. Discuss Evolution as a Theory.
160. SCIENTIFIC THEORY MUST BE TAUGHT
161. Science, not creationism
162. Teach evolution
163. Keep evolution in the standards

164. This not the reason for my current comments.
165. I would advise the working group to not make any revisions to the Life Science Standards in the Kindergarten 2018 Draft Science Standards.
166. Teach science, not religion.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
167. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
168. No comment.
169. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
170. up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
171. not enough detail
172. Use ONLY scientific facts  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
173. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
174. See comments above.
175. The introduction of the "argument" language in section L4 opens the door to a Pandora's box of dubious challenges to established science.
176. Stick to scientific fact not theoretical religious doctrine.
177. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
178. No comment.
179. no comment
180. See previous comments
181. See comment above
182. teach creationism
183. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.
184. Keep the standards  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
185. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
186. do not revise.
187. teach science not religious dogma
188. No issues
189. Not sure why the word 'observe' is removed here. Observation is essential to scientific inquiry - as an actual scientist, I can tell you that scientists first observe.  
Limiting the study of evolution to "the unity and diversity of living and extinct
190. organisms" is ludicrous. Fiction does not belong in science class, and the international scientific community (who have devoted their lives to studying science) is clear in their endorsement of the theory of evolution.  
Remove key concepts.
191. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.

192. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
193. Teaching the theory of evolution as the overarching basic principle that rules the biological sciences.
194. Kindergarten life science standards are adequate.
195. include evolution as why there are different insects and life forms
196. <https://www.nextgenscience.org/>
197. Life Science standards are broad enough for the Kindergarten level.
198. Does not need any non scientific hypothesis such as creationism
199. See 19
200. Consider how to avoid having t Diane Douglas ruin their work product
201. Keep it simple so the students remain engaged, more hands on lessons.
202. how to fish
203. Evolution should be taught, not creationism.
204. Life science standards could focus on structure and function of organisms vs. body systems if this was a core idea in life science.
205. Adopt NGSS!
206. These standards do not seem to be age/developmentally appropriate. At this grade should focus on what plants/animals need to survive and what they get and give to the environment.
207. At no time should 'conclusions' or 'theories' be presented that are not arrived-at via The Scientific Method.
208. No revision.
209. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
210. See previous comments.
211. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
212. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
213. There is no reason to remove the word "observe"; observation is a core part of the scientific method
214. The constitution
215. The constitution
216. See my comments in no. 15.
217. Actual scientific facts please!!
218. To whom it may concern,

As an infectious disease doctor, my patients' lives and limbs depend on my science knowledge. Protecting our country from biological warfare attacks, disease outbreaks, foodborne illness, diseases affecting our crops and natural disasters will be difficult or impossible without a science-educated workforce.

I feel that it is very important for our students to learn basic science, including facts about evolution, gene technology, global warming and vaccines without interference from religious extremists or science deniers.

Watering down science curriculum with religious nonsense does a disservice to our society, making our country less competitive with more reasonable nations, and less safe.

Sincerely,

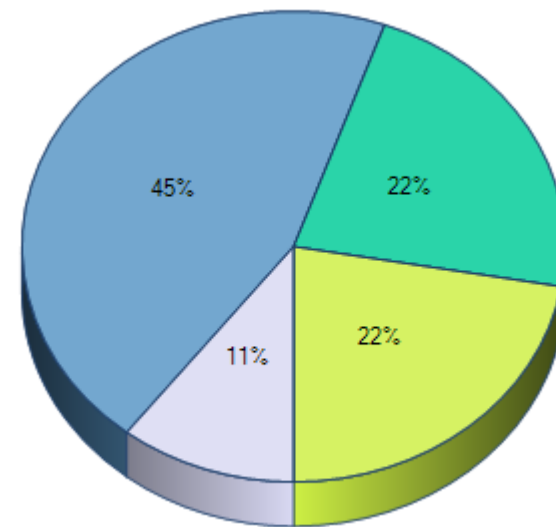
Steven Oscherwitz MD  
Infectious Disease  
Tucson, Arizona

- 219. It's good.
- 220. Nothing
- 221. Written into previous comment.
- 222. Make it developmentally appropriate
- 223. keep evolution; reject intelligent design
- 224. include evolution as science
- 225. No Comment
- 226. N/A
- 227. N/A

228. What level of explanation is being expected and what are accepted versus unaccepted explanations. K students ( have taught K science for 7 years) will come up with some out there explanations. Are we going to accept them if the data support the explanation?  
I think at the K level, it should be mostly observational when it comes to the natural world.

**Total Respondents 228**

**24.** The First Grade Science Standards are appropriate for this grade level and complement the other Grades K-2 Science Standards.



	Response Total	Response Percent
Strongly Agree	60	11%
Agree	256	45%
Disagree	127	22%
Strongly Disagree	127	22%
<b>Total Respondents</b>	<b>570</b>	
<b>(skipped this question)</b>	8267	

**25.** What would you like the working group to consider as they revise the First Grade Science Standards?

1. nothing
2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
3. Not specific enough. Too broad and can leave too much interpretation for later grade levels to struggle with
4. N/a
5. Please consider removing the key concepts section. This makes the model more like our PO model



- giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
6. The standards work for the grade level.
  7. No suggestions
  8. These are not what the committee created
  9. Make the connections to the health standards more clear
  10. Wait to Test.
  11. Nothing in particular.
  12. Nothing
  13. Is this too much for first grade? It seems heavy in extensive, important concepts. Take a second look to consider.  
I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.
  14. Page 9, 21, 33  
Remove last sentence: "Suggestions for key concepts...or maximum content limits."
  15. Pages 12, 15, 19, 24, 28, 31, 37, 41, 45  
Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.
  16. Allow students to think critically throughout each standard of the lesson.
  17. What resources are available to teach these standards
  18. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
  19. The Key concepts should be dropped from every grade level.
  20. Simplification.
  21. would like a check list to be able to follow along
  22. A more clearer perimeters to teach within.
  23. Please provide a starting point. The Big Ideas are great, however there is a concern that information and concepts will be overlooked.
  24. Make sure the first grade standards continue to build on the kinder standards.
  25. Funding
  26. I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.
  27. Adopt NGSS standards
  28. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.  
I question if conceptually first graders can plan and carry out investigations. I believe that they can investigate different phenomena however I do not think that they are conceptually able to plan their own investigation at this age.
  29. Put back in 'In this grade level, students learn how objects can impact other objects from a distance or by contact with each other, how organisms interact with Earth, and how life systems have cycles.
  30. Evolution section is weak and watered down. It needs to be strengthened.
  31. n/a
  32. No comment
  33. Please follow the National science education standards.
  - 34.

35. All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.
36. Do not attempt to deny or water down the concepts of evolution.
37. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
38. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
39. This section is good
40. see above
41. I couldn't care less about First Grade.
42. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
43. Include health standard that includes body awareness  
How are key concepts different than vocabulary lists, as they could be focused on in that way leaving out inquiry entirely. In 1.L4U4.11 is argument and evidence of authors claim taught as a 1st grade ELA skill? If not this would be difficult to do just in science.
44. Restore 1.L4U4.11 to original terminology.
45. Get rid of the "knowing and using science" and key concepts. Integrate more the three dimensions of "A Framework for K-12 Science Education."
46. evolution rather than "theory of"  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
47. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
48. Stick to actual science and stop dumbing down our children!
49. Needs to go back to review.
50. Keep religious beliefs out of science standards.
51. Include all commonly adopted science standards.
52. Please consider what is developmentally appropriate and develop their natural curiosity.
53. Don't teach first, sorry!
54. No specific recommendations for this level
55. I have not read the full draft, so have no comment on this
56. There are some concepts that may be difficult for first graders to grasp. The working of the standard should be looked at in order to make it friendly for the students and teacher.
57. We should only be covering evolution in school. Creationism should be kept separate from schools.  
Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)
58. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
59. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
60. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.

62. Send the standards back for review.
63. Explain evolution.
64. Include Evolution, omit Creationism and "Intelligent Design".
65. Please consider removing 1 P2u2.2 and 1 L3u2.9, these concepts are too complex for first graders. First graders don't need to start thinking about genetics yet!
66. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
67. See kindergarten sections
68. Refer reply in 20 above.
69. ....
70. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
71. Continue to teach evolution. Do not remove it to teach creationism.
72. See above
73. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the scientifically proven models of evolution and Darwinism.
74. Keep the science in science. Looking toward religious groups is moronic.
75. Start teaching the fundamental of evolution.
76. See my comments  
Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.  
  
The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.  
  
The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.  
  
The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.
77. They're in first grade. Some of your standards seems more appropriate for 2nd or 3rd.
78. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
79. Teach proper evolution.
80. Critical thinking; must know that there something it is called Science
81. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
82. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
83. On pg 13, first paragraph, unnecessarily restricts concepts. What is wrong with "survival" as a concept? On pg 14, what is wrong with "evaluating habitats"? Also, groups are classified by differences as well as by similarities.
84. Introduce more scientific concepts. Elaborate upon scientific theory and philosophy.
85. L4
- 86.

87. Evolution
88. as above.
89. All standards need to be included.
90. No comment.
91. Science.
92. See item 24.
93. Add science that is also social science. Anthropology, archaeology, sociology, human development etc
94. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
95. Adding and maintaining teaching Evolution needs to be continued.  
I would like to see more of the engineering design process and computational thinking to be included
96. in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!
97. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
98. Teach Science and facts in Schools not faith and religion.
99. N/A
100. No comment.
101. Fix evolution standards.
102. See comment #9
103. See first comment
104. No issues. Seems appropriate.
105. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
106. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.
107. Please do not muddy the language regarding evolution  
Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
108. Please don't avoid education on evolution.
109. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
110. The sooner kids learn about real science, the better off they will be.
111. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
112. Revert all of Diane Douglas's changes.  
If the state allows teaching creationism, they will also have to teach other religion's creation myths,
113. such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
114. evolution should be included in all grades
115. Bring back the word "evolution."
116. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
117. Climate change should be included in any physical science or earth science class.

- If first grade is supposed to be about cycles, why do the Earth science standards focus on properties of Earth materials? Maybe add a cross-cutting concept focus that addresses properties of materials, such as energy and matter.
118. of Earth materials? Maybe add a cross-cutting concept focus that addresses properties of materials, such as energy and matter.
119. Removal/replacement/minimizing evolution is completely unacceptable.
120. See above
121. Remove all religious references.
122. Consistently omits the focus on investigating and justifying using evidence to support hypothesis.
123. Creationism and intelligent design are okay for churches, not for public education. Do you think that I can study through medical school if I learned intelligent design?
124. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
125. The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.
126. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
127. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
128. Get a scientific expert to rewrite the content or undo the edits.
129. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
130. Clearly include teaching the concept of evolution.
131. Original language should remain
132. Teach evolution. Evolution is science.
133. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
134. Evolution is not a theory.
135. No comment
136. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
137. Only SCIENCE in Science class!
138. See kindergarten comments.
139. Actual science standards
140. Get rid of "intelligent design." Restore references to evolution.
141. Make them more understandable
142. Not utilize language in re Darwinism, natural selection or evolution.
143. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
144. Don't revise.
145. Any change in curriculum de-emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
146. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a

disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.

147. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
148. A first grader's level of understanding of the Theory of Evolution.

Without ADE additions, this would be a strongly agree.

Connections to other academic disciplines.

- Remove entirely from the document. This belongs in a support document or curriculum adopted locally.
- These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board.
- Additionally, many of the connections cited don't actually align to the standards within the grade level.

Key concepts Column

- What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level.
  - Remove they key concepts column from the document.
  - If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards.
149. • Key concepts, if included must represent concepts from all three dimensions, and not just the content of science.

Below is an example for 1.P3U1.3 Follow this process for each of the first grade standards, not just the example below.

Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions:

- With guidance, plan and conduct an investigation in collaboration with peers.
- Scientists use different ways to study the world.
- Pushes and pulls can have different strengths and directions.
- Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it.
- When objects touch or collide, they push on one another and can change motion.
- A bigger push or pull makes things speed up or slow down more quickly.
- Simple tests can be designed to gather evidence to support or refute student ideas about causes.

150. Evolution

151. Teach our children science and not nonsense.

152. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.

The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.

153. How about grade-appropriateness? Since you started off on the wrong foot with Kindergarten students, 1st graders are already starting from a knowledge deficit. This problem progresses through out these "standards". By the time you reach 5th grades science is a lost cause for our kids.

154. They can focus elsewhere with their improvements.

155. Please teach evolution and not creationism

156. Applied sciences.

157. SCIENTIFIC THEORY MUST BE TAUGHT

158. Same as above

159. Teach evolution

160. This not the reason for my current comments.



162. I would advise the working group to not make any revisions to First Grade 2018 Draft Science Standards.  
I am not sure if you asking if the current standards are appropriate or the new ones. My only concern
163. is with the adding in of creationism. Leave it out. Parents can teach that at home or kids can learn it at Sunday School.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
164. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
165. No comment.
166. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
- 167.
168. not enough detail
169. Use ONLY scientific facts  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
170. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
171. See comments above.
172. Same objection - the language of L4 - "seeks to make clear" as if it is not established science.
173. Stick to scientific fact not theoretical religious doctrine.
174. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
175. No mention of religion in any form.
176. no comment
177. See previous comments
178. Teach creationsim
179. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.
180. Keep the standards  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
181. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
182. do not revise.  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
183. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
184. teach science not religious dogma
185. Make these science standards as it states in the title, not science and engineering standards.
186. Not able to access - 404 error  
Remove key concepts.
187. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
188. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review

- draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
189. see above
  190. First grade science standards are adequate.
  191. none
  192. <https://www.nextgenscience.org/>
  193. This is a new and different way of teaching science and teachers will need training, materials, and space.
  194. The standards are appropriate.
  195. Does not need any non scientific hypothesis such as creationism
  196. See 19
  197. Don't let Douglas make it political
  198. More hands on learning. Only data based information.
  199. build on the flat earth model
  200. Evolution should be taught, not creationism.
  201. The proposed key concepts column should be rejected. Where is engineering?
  202. Teach that evolution is not a theory, but a fact.
  203. Adopt NGSS!
  204. No revision.
  205. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
  206. See previous comments.
  207. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
  208. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
  209. In L4: Replace "seeks to make clear" with "explains".
  210. These standards seem to be sufficient. Not sure why the bit about objects being impacted from a distance or by contact was removed.
  211. The constitution the constitution
  212. The constitution
  213. See my comments in no. 15
  214. Ditto!
  215. All good.
  216. Next generation science standards
  217. nothing
  218. Make it developemntally appropriate
  219. Not appropriate for first grade.
  220. keep evolution reject intelligent design
  221. include evolution as science

- I have not analyzed to new standards grade by grade. So I will not be able to answer this and the following questions with any specificity. I begin by assuming the competence of the teachers and educators involved in creating the standards. What I obviously object to is the lack of such competence in a right-wing political hack like Diane Douglas.
222. I have not analyzed to new standards grade by grade. So I will not be able to answer this and the following questions with any specificity. I begin by assuming the competence of the teachers and educators involved in creating the standards. What I obviously object to is the lack of such competence in a right-wing political hack like Diane Douglas.
223. No Comment
224. N/A
225. n/a
226. N/A
227. Some of the edits are absolutely terrible and need to be fixed by scientists.

**Total Respondents 227**

**26.** What would you like the working group to consider as they revise the Physical Science Standards in the First Grade Science Standards?

1. nothing
2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
3. N/a
4. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
5. They need more clarification.
6. no suggestions
7. These are not what the committee created
8. Wait to Test.
9. Nothing in particular.
10. Nothing  
Page 13  
Remove Key Concepts Column
11. Under 1.P2U1.1 - what did the green type replace - will 1st grade really plan investigations, or just carry them out? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
12. should offer key concepts to include instead of saying "refer to standard"
13. good
14. Simplification.
15. A more clearer perimeters to teach within.
16. Be specific with language.
17. Funding
18. Adopt NGSS standards
19. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.  
I question if conceptually first graders can plan and carry out investigations. I believe that they can investigate different phenomena however I do not think that they are conceptually able to plan their own investigation at this age.
20. I question if conceptually first graders can plan and carry out investigations. I believe that they can investigate different phenomena however I do not think that they are conceptually able to plan their own investigation at this age.
21. n/a

22. n/a
23. No comment
24. Please follow the National science education standards.
25. Do not attempt to deny or water down the concepts of evolution.
26. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
27. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
28. This section is good
29. see above
30. I couldn't care less about First Grade.
31. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
32. When are simple machines introduced as a concept? I see they are to be used in design but without a supporting standard or sub standard to introduce them.
33. These physical science standards lack continuity, I understand the theme of causal relationships, but the reality of having materials for these isolated experiences is unrealistic.
34. N/A  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
35. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
36. Stick to actual science and stop dumbing down our children!
37. Needs to go back to review.
38. Keep religious beliefs out of science standards.
39. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
40. Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
41. NO teaching of intelligent design or creationism in any classroom! Religious instruction belongs at home.
42. We should only be covering evolution in school. Creationism should be kept separate from schools.
43. Send the standards back for review.
44. Explain evolution.
45. Include Evolution, omit Creationism and "Intelligent Design".
46. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact

based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earth's problems.

47. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
48. Refer reply in 20 above.
49. ....
50. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
51. Continue to teach evolution. Do not remove it to teach creationis
52. See above
53. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
54. It is the same for every grade. Improve science; don't make it worse.
55. Refer to my response to question 17.
56. Teach proper evolution
57. Critical thinking; must know that there something it is called Science. scientific method
58. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
59. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
60. Ambivalent.
61. Evolution
62. All standards need to be included.
63. No comment.
64. Science from real scientists.
65. See item 24.
66. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
67. Adding and maintaining teaching Evolution needs to be continued.
68. I would like to see these standards blend together better so it would be easier for the teacher to teach them. The physics concept could be taught in 2nd grade for example. For teh engineering design process: whet not have students think about how they can use light and sound to solve problems?
69. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
70. Teach Science and facts in Schools not faith and religion.
71. N/A
72. No comment.
73. Fix evolution standards.
74. See comment #9
75. N/a
76. Only facts based on repeatable scientific tests.
77. Please do not muddy the language regarding evolution

78. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
79. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
80. Revert all of Diane Douglas's changes.
81. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
82. evolution should be included in all grades
83. Ditto
84. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
85. Climate change should be included in any physical science or earth science class.
86. 1.P4U3.4 - This standard seems too abstract for 1st grade. It seems like this standard was just added to try to include a P4 standard for 1st grade when maybe this idea should not be addressed until later. I could see a standard related to solutions to increasing or reducing friction to make an object move faster or slower because it fits better with 1.P3U1.3 and is less abstract.
87. Removal/replacement/minimizing evolution is completely unacceptable.
88. See above
89. Remove all religious references.
90. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
91. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
92. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
93. Get a scientific expert to rewrite the content or undo the edits.
94. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
95. Clearly include teaching the concept of evolution.
96. Original language should remain
97. Teach evolution. Evolution is science.
98. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
99. No comment
100. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
101. Only SCIENCE in Science class!
102. See kindergarten comments.
103. Get rid of "intelligent design." Restore references to evolution.
104. Don't teach 1st.
105. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
106. Don't revise.



107. Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
108. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
109. A first grader's level of understanding of the Theory of Evolution.
110. Standard 4. Solutions is an inappropriate term that implies that friction is a problem that needs to be solved. Ways is the correct term.
111. Teach evolution and use up to date information
112. Teach our children science and not nonsense.
113. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
114. No comment as I don't believe these standards are fixable.
115. They can focus elsewhere with their improvements.  
Consider incorporating critical thinking skills that accompany deep learning, and design standards that incorporate students innovating with the knowledge of the standard's concept(s) to develop solutions to scenarios that are real to them.
116. Please teach evolution and not creationism
117. Weather and mapping
118. SCIENTIFIC THEORY MUST BE TAUGHT
119. Teach evolution
120. I would advise the working group to not make any revisions to Physical Science Standards First Grade 2018 Draft Science Standards.
121. Stick to the facts and leave religion out.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
122. No comment.
123. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
124. not enough detail
125. Use ONLY scientific facts  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
126. Teach science, not religion. See comments above.
127. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.

134. More anatomical structures of human forms.
135. no comment
136. See previous comments
137. Keep the standards
138. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
139. do not revise.  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
140. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
141. teach science not religious dogma
142. Not able to access - 404 error  
Remove key concepts.
143. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
144. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
145. see above
146. First grade science standards are adequate.
147. NONE
148. <https://www.nextgenscience.org/>
149. Nothing at this time.
150. Does not need any non scientific hypothesis such as creationism
151. See 19
152. Introduce the concept of fields early (not sure when is best). That commneg is inspired by Sean Carol (Cal tech).
153. Make it fun to learn.
154. Evolution should be taught, not creationism.
155. Adopt NGSS!
156. At no time should 'conclusions' or 'theories be presented that are not arrived-at via use of The Scientific Method.
157. No revision
158. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
159. See previous comments.
160. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
161. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
162. The changes here are generally positive
163. The constitution

- 164. The constitution
- 165. Actual scientific facts please!!  
Please remove the first grade standards 1.P2U1.1 and 1.P2U2.2 as there is no clear learning progression and they are developmentally inappropriate. If you look at the document, "Working with Big Ideas of Science Education" you will see this clearly communicated.
- 166. progression and they are developmentally inappropriate. If you look at the document, "Working with Big Ideas of Science Education" you will see this clearly communicated.
- 167. All good.
- 168. Make it developmentally appropriate
- 169. keep evolution; reject intelligent design
- 170. include evolution as science
- 171. No Comment
- 172. N/A
- 173. N/A
- 174. Will students be testing their predictions or just making them? Not much point in only making predictions.

**Total Respondents 174**

**27.** What would you like the working group to consider as they revise the Earth and Space Science Standards in the First Grade Science Standards?

- 1. nothing
- 2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
- 3. N/a
- 4. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
- 5. We like the standards!
- 6. no suggestions
- 7. These are not what the committee created
- 8. Wait to Test.
- 9. Nothing in particular.
- 10. Nothing
- 11. Page 14  
Remove Key Concepts Column
- 12. good
- 13. A more clearer perimeters to teach within.
- 14. Include a lot of experiments that are inviting and interesting for students.
- 15. Funding
- 16. Adopt NGSS standards
- 17. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
- 18. no comments
- 19. Develop and use models about how living things use resources to grow and survive;

- TAKE OUT design and evaluate habitats for organisms using earth materials. Changes the whole meaning of this- take it out
20. n/a
  21. n/a
  22. No comment
  23. Please follow the National science education standards.
  24. Do not attempt to deny or water down the concepts of evolution.
  25. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
  26. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
  27. This section is good
  28. see above
  29. I couldn't care less about First Grade.
  30. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.  
1.E1U1.5 This standard no longer represents the intersection indicated in the coding. The Core Idea is about how materials on Earth change based on natural and human processes. This standard is now memorization/fact recall and regurgitation.
  31. E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate.
  32. N/A  
The way it is worded is more of a life sciences standard. The "Framework" suggests Earth science ideas of events on Earth (pg. 178). More closely related to the way in which the current draft reads, the "Framework" has the concept that "wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things." (pg. 180)  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
  33. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
  34. Stick to actual science and stop dumbing down our children!
  35. Needs to go back to review.
  36. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
  37. We should only be covering evolution in school. Creationism should be kept separate from schools.
  38. From the Life Sciences (1.L2U2.7) - Create a standard that states: Using earth materials, design and evaluate a habitat for organisms.
  39. Send the standards back for review.
  40. Send the standards back for review.

42. Explain evolution.
43. Include Evolution (where relevant), omit Creationism and "Intelligent Design".
44. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
45. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
46. Refer reply in 20 above.
47. ....
48. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
49. Continue to teach evolution. Do not remove it to teach creationism.
50. Evolution
51. See above
52. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
53. Refer to my response to question 17.
54. we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.
55. Teach proper evolution
56. Critical thinking; must know that there something it is called Science. scientific method
57. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
58. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
59. Ambivalent.
60. Evolution
61. All standards need to be included.
62. No comment.
63. Science from real scientists
64. See item 24.
65. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
66. Adding and maintaining teaching Evolution needs to be continued.
67. These seem to be lacking a lot! There is only one standard?
68. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
69. Teach Science and facts in Schools not faith and religion.
70. N/A
71. No comment.
72. Fix evolution standards.
73. See comment #9

74. N/a
75. Only facts based on repeatable scientific tests.
76. Please do not muddy the language regarding evolution
77. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
78. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
79. Revert all of Diane Douglas's changes.
80. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
81. evolution should be included in all grades
82. Ditto
83. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
84. Climate change should be included in any physical science or earth science class.
85. Removal/replacement/minimizing evolution is completely unacceptable.
86. See above
87. Remove all religious references.
88. I would like them to use newst time line dates for varied rock formations.
89. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
90. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
91. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
92. Get a scientific expert to rewrite the content or undo the edits.
93. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
94. Clearly include the teaching of the concept of evolution.
95. Original language should remain
96. Teach evolution. Evolution is science.
97. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
98. No comment
99. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
100. Only SCIENCE in Science class!
101. See kindergarten comments.
102. Climate change
103. Get rid of "intelligent design." Restore references to evolution.
104. Don't teach 1st



105. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
106. Don't revise.  
Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong.
107. Period. Evolution through natural selection over millenia is a scientific fact.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
108. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
109. Climate change needs to be included  
Page 14, 1.E1U1.5: While it is important to "Obtain, evaluate, and communicate," the removal of the word Investigate implies that a student can just "obtain" this information from a book or the Internet and not carry out their own investigations which is critical for real understanding
110. word Investigate implies that a student can just "obtain" this information from a book or the Internet and not carry out their own investigations which is critical for real understanding
111. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
112. A first grader's level of understanding of the Theory of Evolution.
113. Evolution
114. Teach our children science and not nonsense.
115. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
116. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
117. No comment as I don't believe these standards are fixable.
118. They can focus elsewhere with their improvements.  
Consider incorporating critical thinking skills that accompany deep learning, and design standards that incorporate students innovating with the knowledge of the standard's concept(s) to develop solutions to scenarios that are real to them.
119. incorporate students innovating with the knowledge of the standard's concept(s) to develop solutions to scenarios that are real to them.
120. Please teach evolution and not creationism
121. Visitors
122. SCIENTIFIC THEORY MUST BE TAUGHT
123. Teach evolution
124. This not the reason for my current comments.
125. I would advise the working group to not make any revisions to Earth and Space Science Standards First Grade 2018 Draft Science Standards.
126. Science not religion.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
127. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
128. No comment.
129. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
130. science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
131. not enough detail

132. Stick to FACTS, verifiable scientific facts.  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
133. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
134. See comments above.
135. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
136. Consideration of life on other Planets.
137. no comment
138. See previous comments
139. Keep the standards  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
140. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
141. do not revise.  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
142. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
143. teach science not religious dogma
144. Not able to access - 404 error
145. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
146. see above
147. First grade science standards are adequate.
148. none
149. <https://www.nextgenscience.org/>
150. Significant at this time. Nothing to add.
151. Does not need any non scientific hypothesis such as creationism
152. See 19
153. Keep it simple. It really does not need changing.
154. Evolution should be taught, not creationism.
155. Adopt NGSS!
156. Same as above.
157. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
158. See previous comments.
159. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
160. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
161. This is fine

- 162. The constitution
- 163. The constitution
- 164. Additional standard on human impact as it relates to earth materials
- 165. Same as above!!
- 166. All good.
- 167. Bring back learning about objects in the sky and changes in the earth and sky. Students need to learn about the Earth, Planets, and Sky. You can't just take it out and expect them to be taught at home. It's not the parents job to teach them about science. It's our job as educators.
- 168. Please include space in the standards. It seems as though it has been removed completely.
- 169. keep evolution; reject intelligent design
- 170. include evolution as science
- 171. No Comment
- 172. N/a
- 173. N/A
- 174. Include space exploration, celestial objects, stars, satellites, and other entities that will help the understanding of the planet we live on.

**Total Respondents 174**

**28.** What would you like the working group to consider as they revise the Life Science Standards in the First Grade Science Standards?

- 1. nothing
- 2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
- 3. The evolution and genetic information standards should be kept in elementary grades, however they are likely too abstract for 1st and 2nd grade. I have extensive experience teaching these concepts to older students and am basing this suggestion on my experience, as well as my content and pedagogical knowledge. These concepts would be much more appropriate for 3rd or 4th grade.
- 4. N/a
- 5. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
- 6. Instead of the word "argument" use the word discussion. Instead of using the word organisms use the words animals and plants to make it consistent through out all the standards.
- 7. no suggestions
- 8. These are not what the committee created
- 9. Wait to Test.
- 10. Nothing in particular.
- 11. Nothing
- 12. Page 14  
Remove Key Concepts Column

Under 1.L2U2.7 - remove "design and evaluate habitats for organisms using earth materials." - it is repetitive of what the teachers have in the first part of the sentence.

Remove 1.L4U2.10 - since it is in green, the teacher's did not indicate that this is a standard that should be taught at the 1st grade level.

Under 1.L4U4.11 - remove "or entire species" - the term 'organisms' covers it - so this addition is repetitive. Renumber to 4.10 (see comment on 4.10 above.)

13. good
14. Simplification.
15. A more clearer perimeters to teach within.
16. Funding
17. Adopt NGSS standards
18. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.  
1.L4U4.11
19. I don't think that the addition of "or entire species" is necessary. Based on my understanding or extinction if an organism is extinct then that species is also extinct.  
1L4U2.10 Classification of vertebrates and invertebrates is again developmentally inappropriate.
20. Gets wordy when adding positively and negatively all over the place. When discussing impacts it is implied that you would discuss both.
21. Evolution section is weak and watered down. It needs to be strengthened.
22. n/a
23. No comment
24. Please follow the National science education standards.
25. 1.L4U4.11 - this exact standard is found in the 4th grade standards, 4.L4U4.12  
I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.
26. The changes proposed to L4.U4.11 seem totally misguided. "Use evidence to support" is science.
27. Engaging in arguments is not what science is about, seeking explanations for the evidence is the key. Please change this wording back to what it was.
28. Do not attempt to deny or water down the concepts of evolution.
29. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
30. this section is good
31. Keep religion out of it!!
32. I couldn't care less about First Grade.
33. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
34. 1.L2U2.7 The green portion is not a life science concept. This standard is repeated in 2nd grade
35. Restore 1.L4U4.11 to original terminology.  
Discussion of offspring not being identical to their parents, classification of organisms, and species extinction are age-inappropriate. Discussion of topics related to inheritance and evolution should be delayed until later grades.
36. If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.
- 37.
- 38.

39. I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.  
I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
40. Stick to actual science and stop dumbing down our children!
41. Needs to go back to review.
42. Keep religious beliefs out of science standards.
43. Please revise.  
  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
44. See previous comments on the treatment of evolutionary biology.
45. We should only be covering evolution in school. Creationism should be kept separate from schools.  
  
Delete 2nd part of 1.L2U2.7 -- the combination of those two big ideas need to be separated. Or rewrite the standard  
Delete 1.L4U2.10 -- this concept of classifying goes with Kindergarten where they are observing characteristics of living and non-living.
46. Standard 1.L4U4.11 is almost exactly written as the 4th grade standard. My want to change delete "species" and keep only organisms. Including the learning progressions from A Framework (pg. 165) would help determine how far to go with this concept (assessment boundary)
47. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
48. Don't eliminate references to evolution, as it's necessary to understand life sciences.
49. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
50. Evolution must be taught.
51. Send the standards back for review.
52. Explain evolution.
53. Include Evolution, omit ANY MENTION OF Creationism and "Intelligent Design".  
  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
54. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
55. Refer reply in 20 above.
56. ....
57. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
58. Continue to teach evolution. Do not remove it to teach creationism.  
  
Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
59. Refer to my response to question 17.

63. Metamorphosis may be a hard concept for someone who is 5 or 6 years old.
64. Darwin please.
65. Teach Charles Darwin theory of Evolution.
66. Strengthen the teaching of evolution and global change to reflect the science of these subjects.
67. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
68. we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.
69. Teach proper evolution
70. Critical thinking; must know that there something it is called Science. scientific method
71. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.  
Nothing should be taught within or alongside science that does not have the same factual basis that
72. all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
73. STOP calling Evolution a theory.
74. More on evolution.
75. L4
76. Evolution
77. All standards need to be included.
78. Evolution needs to be added back in as fact.
79. Science from real scientists.
80. See item 24.
81. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
82. Adding and maintaining teaching Evolution needs to be continued.  
Engage in argument from evidence to support a claim about the factors that cause organisms or entire species to go extinct and analyze how humans can positively or
83. negatively impact those factors.  
How about including something where students are working to create something that may help to solve these problems?
84. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
85. Teach Science and facts in Schools not faith and religion.
86. N/A
87. No comment.
88. Fix evolution standards.
89. See comment #9
90. See first comment
91. An attack on the hard work and mountains of evidence-based study to support a delusion
92. N/a
93. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
94. Only facts based on repeatable scientific tests.



95. I would like to see the phrase "the theory of evolution" taken out of the standards and replaced with the word "evolution"
96. Please do not muddy the language regarding evolution  
Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
97. Please don't avoid education on evolution.
98. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
99. Teach Evolution
100. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
101. Revert all of Diane Douglas's changes.  
If the state allows teaching creationism, they will also have to teach other religion's creation myths,
102. such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
103. evolution should be included in all grades
104. They need to start learning about where they and everything came from, via evolution
105. Ditto
106. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
107. Evolution should be included in any life science or biological class
108. 1.L4U4.11 - Organisms die but do not go extinct. Species go extinct.
109. E
110. Removal/replacement/minimizing evolution is completely unacceptable.
111. This is redundant.
112. Remove all religious references.
113. Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.
114. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.  
"Engage in argument from evidence to support a claim about the factors that cause organisms or entire species to go extinct and analyze how humans can positively or negatively impact those factors."
115. When an organism becomes extinct, it is the entire species that goes extinct. It is not necessary to add "or entire species" as scientists realize this fact.
116. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind boggling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
117. Get a scientific expert to rewrite the content or undo the edits.
118. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
119. This applies to the "Distribution of K-2 standards" - page 20:  
" L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms."  
This is imprecise. In each section this should read "The study of evolution seeks to demonstrate..."
- 120.

First, evolution is an established scientific theory.

A scientific theory differs from the "street" use of theory, which indicates a "guess" about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.

Two things distinguish evolution as a "scientific theory" from the more general use of "theory." First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven.

Thus it is the STUDY of evolution – mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to "test" the underlying theory) – that have provided evidence of "the unity and diversity of living and extinct organisms."

121. Clearly include the teaching of the concept of evolution.
122. Original language should remain
123. Teach evolution. Evolution is science.
124. Evolution should be presented as proven theory backed by vast amounts of physical data. Cratationism has no place in science curriculum even as an alternative theory.
125. We need to start teaching children about all aspects of life including evolution from the very beginning.  
I'd like the kids, at this age, to "use evidence" not "engage in argument." I'm sure the intention was
126. to imply critical thinking, but it represents a standard for challenge. Using evidence involves thinking critically to research, support and defend an article.
127. Evolution is not a theory.  
1.L3U2.9, and the identical standard in grades 5 and 8 ignore that some plants, notable two
128. important desert plants, creosote and agaves, can also reproduce through cloning, producing plants that are genetically identical to the parent plant.
129. No comment
130. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
131. Only SCIENCE in Science class!
132. See kindergarten comments.
133. Environmental studies should include information regarding human impact.
134. Evolution
135. Get rid of "intelligent design." Restore references to evolution.
136. Don't teach 1st  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or
137. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
138. Don't revise.  
Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the
139. replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
140. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
141. Include evolution
142. 1.L4U2.10 under key concepts should refer to Kingdoms as a fundamental concept, as invertebrates are not organisms lacking backbones, they are animals lacking backbones. So what is an animal?
143. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to

- "Theory of Evolution" is a step backwards not an improvement.
144. A first grader's level of understanding of the Theory of Evolution.
  145. Evolution
  146. Teach our children science and not nonsense.
  147. That intelligent Design is just one of several approaches to Life Science, and not the exclusive nor irrefutable means to explain development of any forms of life.
  148. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
  149. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
  150. No comment as I don't believe these standards are fixable.
  151. Why are microorganisms not mentioned? They are the majority of species on Earth. First graders are old enough to understand that there are real things that they cannot see with the naked eye.
  152. They can focus elsewhere with their improvements.
  153. Please teach evolution and not creationism
  154. Creationalism and itelligent design
  155. SCIENTIFIC THEORY MUST BE TAUGHT
  156. Teach evolution
  157. As above
  158. This not the reason for my current comments.
  159. I would advise the working group to not make any revisions to Life Science Standards First Grade 2018 Draft Science Standards.
  160. Science not religion.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
  161. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
  162. No comment.
  163. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
  164. science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
  165. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
  166. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
  167. See comments above.
  168. Section L4
  169. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
  170. The introduction of how our life originates.
  171. no comment
  172. See previous comments

173. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.
174. Keep the standards  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
175. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
176. do not revise.  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
177. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
178. teach science not religious dogma  
Limiting the study of evolution to "the unity and diversity of living and extinct
179. organisms" is ludicrous. Fiction does not belong in science class, and the international scientific community (who have devoted their lives to studying science) is clear in their endorsement of the theory of evolution.  
Remove key concepts.
180. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
181. Do not present evolution as a theory.
182. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
183. see above
184. First grade science standards are adequate.
185. include evolution as why there are different insects and life forms
186. <https://www.nextgenscience.org/>
187. Significant at this time. Nothing to add.
188. Does not need any non scientific hypothesis such as creationism
189. See 19
190. Keep it based on scientific data.
191. conclusion: no religious...creationism...intelligent design in SCIENCE curriculum
192. Evolution should be taught, not creationism.
193. Teach that evolution is not a theory, but a fact.
194. Adopt NGSS!
195. Same as above.
196. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
197. See previous comments.  
When you talk about how "humans can positively or negatively impact" extinction of species, you are
198. no longer talking about science, but rather policies and politics. Whether white rhinos should be preserved or not is not science.
199. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
200. These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like to add that these kinds of ideas are what make Arizona's educational system the butt of so many

- jokes.  
What utter nonsense.
201. 2.L2U1.10 under key concepts: I recommend replacing "the balance of nature" with "the interdependence of organisms and their environment".
202. Changing "use evidence" to "engage in an argument from evidence" is puzzling
203. The constitution
204. The constitution
205. See my comments in no. 15
206. Same as above!!
207. All good.
- The following standards are NOT DEVELOPMENTALLY APPROPRIATE for 1st grade. Standard 9 is basically about teaching students genetics which I didn't learn until high school. Standard 10 is about dividing animals into groups based on the classification of invertebrates and vertebrates. Again, I did not learn this until middle school. Standard 11 is learning about extinction and how humans can effect that. Again, that shouldn't be learned until high school when students can process the material. I'm
208. sorry but whoever thought those three standards would be appropriate for a 6 and 7 year old is crazy! They need to be learning the basics. It's fine to have higher DOK levels but understand what is developmentally appropriate for that grade level. I'm gonna be honest.. if those standards are going to be kept I won't teach them because it's too complex of a concept for 1st graders to know. You can't go from one extreme to the next without some steps along the way. You are setting these kids up for failure with the current draft of science standards.
209. keep evolution; reject intelligent design.
210. include evolution as science
211. No Comment
212. na
213. N/A

**Total Respondents 213**

**29.** The Second Grade Science Standards are appropriate for this grade level and complement the other Grades K-2 Science Standards

		<b>Response Total</b>	<b>Response Percent</b>
Strongly Agree		<b>56</b>	<b>11%</b>
Agree		<b>232</b>	<b>44%</b>
Disagree		<b>113</b>	<b>21%</b>
Strongly Disagree		<b>131</b>	<b>25%</b>
<b>Total Respondents</b>		<b>532</b>	<b>100%</b>

**30.** What would you like the working group to consider as they revise the Second Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Key concepts: I would like to see a little more detail in each category so I know that I am addressing all the points this standard entails.
3. Keep the environment-related standards. Also, preserve the "argumentation from evidence" aspects in the K-2 standards.
4. Same as first. The problem for middle school and high school teachers is not enough consistency at elementary level. Standards need to be more precise.

5. N/a
6. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
7. The earth and space sciences seem unequally covered compared to life and physical science. Reduce Earth & Space standards (too many with a vast amount of concepts) and increase Life Sciences (more applicable to primary grades.)
8. I noted all of the items I felt were missing from the standards on a previous question.
9. no suggestions
10. These are not what the committee created
11. Nothing in particular.
12. Nothing
13. I was confused because in the third grade standards it references that second grade would cover body systems. I know these were in the old standards but did not see where they were in the new standards. Are they missing? Should the basics be there?
14. I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.  
Page 9, 21, 33  
Remove last sentence: "Suggestions for key concepts...or maximum content limits."
15. Pages 12, 15, 19, 24, 28, 31, 37, 41, 45  
Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.
16. Allow students to think critically throughout each standard of the lesson.
17. N/c
18. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
19. The Key concepts should be dropped from every grade level.
20. Simplification.
21. Standards should be listed in level of importance. Some standards are interdependent, but the depth of knowledge is still too great to cover them all.
22. i fell its very vague and broad ... need more specific
23. A more clearer perimeters to teach within.
24. More specific information for the elementary level; examples, etc.
25. Please provide a starting point. The Big Ideas are great, however there is a concern that information and concepts will be overlooked. It is too broad and vague.
26. Funding
27. take out the interpretation (standard 7) of how changes in land and water impact humans. rather focus on the facts of how the land and water on earth moves naturally: the natural processes that have been going on here even before man was around.
28. I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.
29. Adopt NGSS standards
30. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
31. Most are good.
32. AGAIN PLEASE return to the original: By the end of second grade, students understand the basic



concept that energy can change phase and is necessary for life. In this grade level, students will understand how energy flow and matter cycling is seen in the interactions with the surface features of Earth, water cycles, and the environment.

33. Evolution section is weak and watered down. It needs to be strengthened.
34. n/a
35. No comment
36. Please follow the National science education standards.
37. All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.
38. Please do not use the word "formerly" with "the scientific method". There is a distinct difference between engineering practices and the scientific method. The one is NOT a substitution for the other and formerly is wholly inappropriate here.
39. Do not attempt to deny or water down the concepts of evolution.
40. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
41. This section is good
42. see above
43. I couldn't care less about Second Grade.
44. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
45. Include health standard that includes body awareness  
General question; where any of the national standards looked up as purchasing materials that align with content and grade level will be difficult for districts unless Arizona Dept of Ed is planning to publish these.
46. TEACH EVOLUTION!
47. N/A
48. Get rid of the "knowing and using science" and key concepts. Integrate more the three dimensions of "A Framework for K-12 Science Education."
49. evolution rather than "theory of"  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
50. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
51. Stick to actual science and stop dumbing down our children!
52. Needs to go back to review.
53. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
54. Please revise.
55. Please consider what is developmentally appropriate and develop their natural curiosity.
56. Don't teach 2nd, sorry!

59. No specific recommendations for this level
60. I have not read the full draft, so have no comment on this
61. We should only be covering evolution in school. Creationism should be kept separate from schools.
62. Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)
63. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
64. Send the standards back for review.
65. Explain evolution.
66. Include Evolution, omit Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
67. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
68. Refer reply in 20 above.
69. ....
70. ....
71. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
72. Continue to teach evolution. Do not remove it to teach creationism.  
Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the scientifically proven models of evolution and Darwinism.
73. Continue teaching evolution.
74. Refer to my response to question 17.  
Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.  
  
The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.  
  
The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.  
  
The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.
75. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
76. Teach proper evolution
77. I like that evolution was mentioned.
78. Evolution must continue to be taught
79. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
80. Nothing should be taught within or alongside science that does not have the same factual basis that

- all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
83. The use of the word "transformation" (pg 16, 1st paragraph) has religious connotations and should be changed back to "phase change" which is a scientific concept.
  84. Introduce more scientific concepts. Encourage the development of simple hypotheses and experimentation.
  85. L4
  86. Evolution
  87. All standards need to be included.
  88. No comment.
  89. see previous comments.
  90. See item 24.
  91. Add social science
  92. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
  93. Adding and maintaining teaching Evolution needs to be continued.
  94. I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!
  95. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
  96. Teach Science and facts in Schools not faith and religion.
  97. N/A
  98. No comment.
  99. Fix evolution standards.
  100. See comment #9
  101. No issues. Seems appropriate.
  102. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
  103. Science doesn't require belief. It requires facts. It can be proven and that proof can be repeated.
  104. Please do not muddy the language regarding evolution
  105. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
  106. Teach Evolution
  107. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
  108. Revert all of Diane Douglas's changes.
  109. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
  110. evolution should be included in all grades
  111. Bring back the word "evolution."
  112. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
  113. Evolution should be included in any life science or biological class
  114. L4, see comments from previous

115. See above
116. Remove all religious references.
117. Eliminate intelligent design, creationism - belongs in church.
118. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
119. The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.
120. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
121. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
122. Get a scientific expert to rewrite the content or undo the edits.
123. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
124. Clearly include the teaching of the concept of evolution.
125. Original language should remain
126. Teach evolution. Evolution is science.
127. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standard
128. In the introduction "sky" needs to be changed back to "environment".
129. Evolution is not a theory.
130. No comment
131. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
132. Only SCIENCE in Science class!
133. See above
134. Get rid of "intelligent design." Restore references to evolution.
135. Don't teach 2nd
136. Not utilize language in re Darwinism, natural selection or evolution.
137. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
138. Don't revise.
139. Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
140. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
141. 8. Page 20, Table Heading labeled U1 – see comment 19 - #5.  
9. Page 20, Table Heading labeled U4 – see comment 19 - #6.
142. There is not enough life science being taught in the second grade.
143. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to

"Theory of Evolution" is a step backwards not an improvement.

144. A second grader's level of understanding of the Theory of Evolution.

Without ADE additions, this would be a strongly agree.

Connections to other academic disciplines.

- Remove entirely from the document. This belongs in a support document or curriculum adopted locally.
- These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board.
- Additionally, many of the connections cited don't actually align to the standards within the grade level.

Key concepts Column

- What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level.
- Remove the key concepts column from the document.
- If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards.
- Key concepts, if included must represent concepts from all three dimensions, and not just the

145. content of science.

Below is an example for 2.E1U3.5 Follow this process for each of the second grade standards, not just the example below.

Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions:

- Develop a model to represent patterns in the natural world.
- Scientists search for cause and effect relationships to explain natural events.
- Maps show where things are located. One can map the shapes and kinds of land and water in any area.
- Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.
- Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.
- Events have causes that generate observable patterns
- Patterns in the natural world can be observed.
- Things may change slowly or rapidly.

146. Evolution

147. Teach our children science and not nonsense.

148. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.

The new standards are unconstitutionally requiring creationism and minimizing and altering factually

149. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.

150. See previous comments for earlier grades.

151. They can focus elsewhere with their improvements.

152. Please teach evolution and not creationism

153. Solid foundational base

154. SCIENTIFIC THEORY MUST BE TAUGHT

155. Teach evolution

156. This not the reason for my current comments.

157. Please don't change or revise the Second Grade 2018 Draft Science Standards

158. Do not add creationism.

159. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
160. No comment.
161. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
162. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
163. not enough detail
164. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
165. See comments above.
166. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
167. More about physical anatomy.
168. no comment
169. See previous comments
170. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.
171. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
172. It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
173. teach science not religious dogma
174. I'm uncomfortable with inserting 'both positive and negative', while provocative, it implies that there are only two impacts: positive and negative. There may be neutral and multi nuanced impacts. I think this inserts unnecessary false dichotomy. Also these should be science standards, not science and engineering standards. Science is not equal to engineering.
175. Not able to access - 404 error
176. Remove key concepts.
177. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
178. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
179. Delete the words "theory of" in the Life Science section.
180. see above
181. Second grade science standards are adequate.
182. Drop the theory of evolution.
183. <https://www.nextgenscience.org/>
184. This is a new and different way of teaching science and teachers will need training, materials, and space.
185. Nothing at this time.



185. Does not need any non scientific hypothesis such as creationism
186. See 19
187. Stay based on simple easy to understand presentations of facts.
188. Evolution should be taught, not creationism.
189. The proposed key concepts column should be rejected. Where is engineering? "Energy can transform" and "energy can change phase" are both incorrect statements.
190. Teach that evolution is not a theory, but a fact.
191. Adopt NGSS!
192. Revisit there are standards where there are no learning progressions listed in the Working With Big Ideas in Science and there are no standards where there are learning progressions.
193. Keep what you already have.
194. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
195. See previous comments.
196. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
197. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
198. In L4: Replace "seeks to make clear" with "explains".
199. They should not make too many changes in content because Districts will not have the funds to re-do all of the science kits, etc. I believe the science we teach now is current and valid.
200. These are adequate
201. The correlation, or lack thereof, to the other standards.
202. No religion in schools Read the constitution no religion
203. The constitution
204. See my comments in no. 15
205. Same as above!!
206. Keep the same sequence as the committee working group.
207. Next generation science standards
208. Not developmentally appropriate
209. keep evolution reject i.d.
210. include evolution as science  
Similar comment to above - Students and teachers should have flexibility at all levels to apply scientific thinking and exploration with topics of interest and within their environment. For example,
211. students living in the desert will think about and experience topics dealing with water, conservation, and resources very different that those living in North Carolina right now facing flooding of rivers and dams.
212. na
213. n/a
214. N/A

**31.** What would you like the working group to consider as they revise the Physical Science Standards in the Second Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. N/a
3. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
4. Looks good
5. none
6. These are not what the committee created
7. Nothing in particular.
8. Nothing
9. Page 16  
Remove Key Concept Column
10. Under 2.P1U2.2 - what did the "transformation (solid, liquid, gas)" replace? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
11. n/C
12. Simplification.  
Order of importance and where they will be getting all the prior knowledge to these concepts from. They are written as if expected to already know about the vocabulary and concepts that they need to know to introduce these. Also, if we are just now implementing these, how do we help the students that didn't learn all of these topics this year? Where is the reteach?
13. more specific areas that they want talked about
14. A more clearer perimeters to teach within.
15. Same! More specifics. We are not exclusively science teachers and need more examples of what these standards mean.
16. Funding
17. Adopt NGSS standards
18. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.  
I am concerned with the word transform, is there a reason for changing it from phase change to transformation? I think we need to make sure we choice our words carefully so that we do not encourage misconceptions to me taught.
19. Change all "transformation" to phase change- make the language universal not one program specific.
20. I work with many students across the nation and Core Knowledge may use this terminology but it is not common.
21. n/a
22. n/a
23. No comment
24. Please follow the National science education standards.
25. Do not attempt to deny or water down the concepts of evolution.
26. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
27. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to

know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.

28. This section is good
29. see above
30. I couldn't care less about Second Grade.
31. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
32. TEACH EVOLUTION!  
2.P1U2.2 Phase change is the appropriate scientific terminology and should be used.  
2.P4U1.3 Thermal energy not heat energy.
33. How are these standards teaching different concepts? A phase change IS a change in the object. Since the standard says heat, then any change other than a phase change is a chemical change. Is that what is being discussed here?
34. N/A  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
35. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
36. Stick to actual science and stop dumbing down our children!
37. Needs to go back to review.
38. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
39. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
40. We should only be covering evolution in school. Creationism should be kept separate from schools.
41. Send the standards back for review.
42. Explain evolution.
43. Include Evolution, omit Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
44. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
45. Refer reply in 20 above.
46. ....
47. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
48. Continue to teach evolution. Do not remove it to teach creationism.

51. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
52. Refer to my response to question 17.
53. Mass is a very difficult concept to explain to 2nd graders. I'd be worried that many elementary teachers will confuse mass and weight. This is NOT a misconception I'd like younger kids to grow up with.
54. we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.
55. Teach proper evolution
56. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
57. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
58. Ambivalent
59. Evolution
60. All standards need to be included.
61. No comment.
62. see previous comments.
63. See item 24.
64. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
65. From New York State Standards "Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. "
66. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
67. Teach Science and facts in Schools not faith and religion.
68. N/A
69. No comment.
70. Fix evolution standards.
71. See comment #9
72. N/a
73. Only facts based on repeatable scientific tests.
74. Please do not muddy the language regarding evolution
75. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
76. Teach Evolution
77. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
78. Revert all of Diane Douglas's changes.
79. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
80. evolution should be included in all grades
81. Ditto

82. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.  
2.P1U2.2 should read "Plan and carry out investigations to gather evidence to support an explanation on how heating or cooling transforms matter (solid, liquid, gas).
83. 2.P4U1.3 seems to address the same idea as 2.P1U2.2. I suggest eliminating 2.P4U1.3.
84. See above
85. Remove all religious references.
86. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
87. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
88. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
89. Get a scientific expert to rewrite the content or undo the edits.
90. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
91. Clearly include the teaching of the concept of evolution.
92. Original language should remain
93. Teach evolution. Evolution is science.
94. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standard
95. No comment
96. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
97. Only SCIENCE in Science class!
98. See kindergarten comments.
99. See above
100. Get rid of "intelligent design." Restore references to evolution.
101. Don't teach 2nd  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
102. Don't revise. Don't revise.  
Any change in curriculum de-emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self-copying DNA in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millennia is a scientific fact.
103. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
104. Page 20, Table Row labeled P4 - see comment 19 - #3.
105. Evolution is not just a theory, it is a well-established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards, not an improvement.
106. A second grader's level of understanding of the Theory of Evolution.
107. Standard 2.Phase change is the correct term.
- 108.
- 109.

110. Again add evolution
111. Teach our children science and not nonsense.
112. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually
113. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
114. See previous comments for earlier grades.
115. They can focus elsewhere with their improvements.  
Consider incorporating critical thinking skills that accompany deep learning, and design standards that
116. incorporate students innovating with the knowledge of the standard's concept(s) to develop solutions to scenarios that are real to them.
117. Please teach evolution and not creationism
118. Weather and mapping
119. SCIENTIFIC THEORY MUST BE TAUGHT
120. Teach evolution
121. This not the reason for my current comments.
122. Please don't change or revise the Second Grade 2018 Draft Physical Science Standards
123. Do not add creationism.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
124. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
125. No comment.
126. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start
127. up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
128. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
129. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
130. See comments above
131. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
132. Again, more about the physical anatomy and how we Scientifically come to life.
133. no comment
134. See previous comments  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
135. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
136. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
137. teach science not religious dogma



- Remove key concepts.
138. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
  139. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
  140. see above
  141. Second grade science standards are adequate.
  142. <https://www.nextgenscience.org/>
  143. Nothing at this time.
  144. Does not need any non scientific hypothesis such as creationism
  145. See 19
  146. More hands on learning.
  147. Evolution should be taught, not creationism.
  148. Adopt NGSS!
  149. Also, there are standards where there are no learning progressions listed in the Working With Big Ideas in Science and there are no standards where there are learning progressions.
  150. At no time should 'conclusions' or 'theories' be presented that have not been arrived-at through use of The Scientific Method.
  151. No revision needed.
  152. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom!
  153. See previous comments.
  154. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom!
  155. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
  156. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
  157. Nothing
  158. Not sure why "phase change" was removed
  159. The constitution no intelligent
  160. The constitution
  161. Same as above!!
  162. keep the same sequence as the committee working group.
  163. Not developmentally appropriate
  164. keep evolution reject i.d.
  165. include evolution as science
  166. No Comment
  167. na
  168. N/A

**32.** What would you like the working group to consider as they revise the Earth and Space Science Standards in the Second Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. N/a
3. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
4. Within the earth and space standards, there are many concepts to be covered. Consider redistributing the quantity of standards to a different grade level. Move 2E2U1.8 to 3rd grade (as it fits with that concept and they only have 1 Earth standard.
5. Add weather (as noted in previous questions) since it ties in with the water cycle and states of matter.
6. no suggestions
7. These are not what the committee created
8. Nothing in particular.
9. Nothing
10. Page 17  
Remove Key Concept Column
11. Under 2.E1U2.5 why were "glaciers" added and "(water cycle) added? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
12. n/c
13. Simplification.  
Where is the previous introduction to this information. In second grade are these topics expected to be continued from the point of introduction of the concept all the way to the depth of knowledge to conducting experiments and explaining why they are happening or important for our planet.
14. A more clearer perimeters to teach within.
15. See above.
16. Funding
17. weather patterns are going to be hard for a second grader to understand and grasp. (standard 6)
18. Adopt NGSS standards
19. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.  
2.E2U1.8
20. The words "Earth's position in relation to" need to be removed, this changes the meaning of this standard and makes it about the Earth's revolution around the sun and less about what is meant which is the Earth's rotation on it's axis. The Earth's position in relation to the Sun is very hard to observe in a 24 hour time frame.  
2.E2U1.8 Wrong- change of wording changed meaning. The earth's position relative to the sun does not change in a 24 hour period. The sun may appear to travel across the sky in a 24 hour period but this standard does not state that.
21. n/a
22. n/a
23. No comment
24. Please follow the National science education standards.
25. Science is about observation and explanation. Please do not change the wording to analyze and

interpret, this seems to change the focus to making things up rather than observing which is the core of science. The words observe and experiment should feature prominently.

27. Do not attempt to deny or water down the concepts of evolution.
28. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
29. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
30. This section is good
31. see above
32. I couldn't care less about Second Grade.
33. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
34. TEACH EVOLUTION! TEACH EVOLUTION!
35. 2.E1U3.6 How will students in 2nd grade test solutions to protect themselves from severe weather conditions? Will they be subjected to hurricane strength winds, severe drought, blizzard conditions, etc?
36. N/A  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
37. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
38. Stick to actual science and stop dumbing down our children!
39. Needs to go back to review.
40. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
41. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
42. also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
43. We should only be covering evolution in school. Creationism should be kept separate from schools.  
Caution: The insert of "water cycle" in 2.E1.u2.3 leads one to having students memorize the water cycle chart. The intent of the standard is that students should be able to identify where water is found on Earth and that it can be solid or liquid -- not that it cycles. Delete "water cycle"
44. 2.E1U2.5 Key Concepts -- if terms are kept delete insert "climate change"
45. Send the standards back for review.
46. Explain evolution.
47. Include Evolution (where relevant), omit Creationism and "Intelligent Design".
48. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact

based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earth's problems.

49. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
50. Refer reply in 20 above.
51. ....
52. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
53. Continue to teach evolution. Do not remove it to teach creationism.
54. Evolution
55. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
56. Refer to my response to question 17.
57. 2.E1U3.6 and 2.E1U3.8 seem too advanced for 2nd grade.
58. we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.
59. Teach proper evolution
60. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
61. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
62. Ambivalent
63. Evolution
64. All standards need to be included.
65. No comment.
66. see previous comments.
67. See item 24.
68. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
69. Adding and maintaining teaching Evolution needs to be continued.  
Develop and use models to represent that water can exist in different states and is found in oceans, glaciers, lakes, rivers, ponds, and the atmosphere (water cycle). - What are the effects when these stages change?
70. This just seems to be thrown in: Analyze and interpret data to explain the Earth's position in relation to the Sun at different times during a twenty-four-hour period and changes in the apparent shape of the Moon from one night to another
71. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
72. Teach Science and facts in Schools not faith and religion.
73. N/A
74. No comment.
75. Fix evolution standards.
76. See comment #9
77. N/a

78. Only facts based on repeatable scientific tests.
79. Climate change should be included - keep "environment"
80. Please do not muddy the language regarding evolution
81. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
82. Teach Evolution
83. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
84. Revert all of Diane Douglas's changes.
85. If the state allows teaching creationism, they will also have to teach other religion's creation myths, such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
86. evolution should be included in all grades
87. 2.E2U1.8 concerning rotation, revolution, axis, sunrise, sunset, sun is a star are big concepts which are not grade level appropriate for 2nd graders in my opinion  
This is where you should introduce tectonic plates. Explain the creation of mountains and valleys and then demonstrate how water takes advantage of this and wind. Don't teach them the parts of the tectonic plates yet but explain that we're on plates.
88. Ditto
89. Ditto
90. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
91. Earth and Space Sciences without big bang cosmology and climate change is woefully inadequate.  
2.E1.U2.5 - Include that water is found underground and also in life forms (e.g. plants and animals). Note: the addition of "water cycle" is appropriate because as worded, this standard does not address that water cycles or the processes for how it moves from one place or state to another.  
2.E1U4.7 - Changes in water or land systems happen all of the time and by themselves are not positive or negative; they are only perceived as positive or negative with respect to what they impact.  
Therefore, change the wording to "Construct an argument from evidence about how changes in water and land systems can have positive and negative impacts on humans and the environment."  
2.E2U1.8 - For 2nd grade, changes in the sky should be limited to day and night and not on the phases of the moon. Also, it is not the relative position of the Earth and sun that cause day and night, but the rotation of the Earth. Suggested revision: "Analyze and interpret data to explain patterns in day and night."  
The I kid ok of erosion in 2nd grade seems delevipmebtally inappropriate and does not seem to have any continuity with the previous or forthcoming grades. This is traditionally taught in 4th grade through NGSS standards.
92. See above
93. Remove all religious references.
94. Consider the claim that advances in science and technology produce products. There should be more emphasis on science and tech being used to understand complex processes and the natural world.
95. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
96. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
97. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
98. Get a scientific expert to rewrite the content or undo the edits.
99. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
100. Clearly include the teaching of the concept of evolution.
- 101.
- 102.

103. Original language should remain
104. Teach evolution. Evolution is science.
105. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standard
106. No comment
107. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
108. Only SCIENCE in Science class!
109. See kindergarten comments.
110. See above
111. Get rid of "intelligent design." Restore references to evolution.
112. Don't teach 2nd
113. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
114. Don't revise.
115. Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
116. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
117. Climate change needs to be included
118. Page 17, 2.E2U1.8: The changes here are out and out bad and wrong! It is critical that students make their own observations (Sun motion and shadows, for example) and try to understand what they have seen, not just analyzing and interpreting data they are given. What has been added is wrong! The Earth's position has not changed much (revolution/orbit), it has rotated on its axis, two very different things. In the Key Concepts, while as an astronomer, I am happy for the students to eventually understand that the Sun is a star, I do not see where that comes from in the Standard as written.
119. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
120. A second grader's level of understanding of the Theory of Evolution.
121. Standards 5. Adding water cycle distracts from broader understanding of where water is found and not just the phases. Standard 8. What data is being analyzed? The observations (original wording) that students are making?
122. I'm serious add evolution back
123. Teach our children science and not nonsense.
124. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
125. The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
126. See previous comments for earlier grades.
127. They can focus elsewhere with their improvements.
128. Consider incorporating critical thinking skills that accompany deep learning, and design standards that incorporate students innovating with the knowledge of the standard's concept(s) to develop solutions



- to scenarios that are real to them.
129. Please teach evolution and not creationism
130. AZ ties to the aerospace industry
131. SCIENTIFIC THEORY MUST BE TAUGHT
132. Teach evolution
133. This not the reason for my current comments.
134. Please don't change or revise the Second Grade 2018 Draft Earth and Space Science Standards
135. Do not add creationism and do not diminish evolution.
- I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
136. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
137. No comment.
138. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
- Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
- 139.
140. not enough detail
- Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
141. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
142. See comments above.
143. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
144. More about the high possibility of life on other planets in the Universe and the inner workings and depths of our Earth.
145. no comment
146. See previous comments
- I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
147. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
- It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
148. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
149. teach science not religious dogma
- Remove key concepts.
150. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
151. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
152. see above
153. Second grade science standards are adequate.
154. <https://www.nextgenscience.org/>
155. Nothing at this time.

156. Does not need any non scientific hypothesis such as creationism
157. See 19
158. More hands on learning based on factual data.
159. Evolution should be taught, not creationism.
160. Adopt NGSS!
161. Also, there are standards where there are no learning progressions listed in the Working With Big Ideas in Science and there are no standards where there are learning progressions.
162. Same as above.
163. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
164. See previous comments.
165. Modern earth and space science . Evolutionary, Big Bang ,
166. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
167. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
168. Seems a little light on weather compared to what we teach now.
169. These are adequate
170. No intelligent design taught on school, period
171. The constitution  
Move 2.E2U1.8 to grade three with related position in space standards. Remaining grade 2 standards
172. all deal with water/wind and there effects on environments. Earth's position in relation to the Sun does not match. Would be taught in isolation of connecting ideas.
173. Same as above!!
174. keep the same sequence as the committee working group.
175. Not developmentally appropriate
176. keep evolution reject i.d.
177. include evolution as science
178. No Comment
179. na
180. N/A

**Total Respondents 180**

**33.** What would you like the working group to consider as they revise the Life Science Standards in the Second Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Move the genetics and evolution standards to 3-4th grade. It is too abstract for earlier grades.
3. N/a
4. Please consider removing the key concepts section. This makes the model more like our PO model

- giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
5. Second grade could absolve some of the first grade standards such as 1.L2U1.8 because it lends itself to the already existing second grade standards.
  6. Add the body systems back in
  7. no suggestions
  8. These are not what the committee created
  9. Nothing in particular.
  10. Put back insects (which appears to be in 1st now)
  11. Nothing
  12. Adding in some human body systems. These kids may never get another chance to learn about their bodies. I would like to see digestive, cardiovascular, and reproductive systems added as these are things that can effect their health and well being.  
Page 18  
Remove Key Concept Column  
  
Page 20
  13. In cell L1, U1, Remove the standard removed in comments above: K.L1U1.5.  
  
In cell L4, U2, Remove the standard removed in comments above: 1.L4U2.10.  
  
In cell L4, U4 - renumber 1.L4U4.11 to 10.
  14. n/c
  15. Simplification.  
  
They're mostly gone and this is what our kids love learning about at this age level. We would rather incorporate the standards around these skills to teach the students why it is important to take care of the planet and what will happen to the animals if we continue to cut down trees and ruin habitats. It helps the students put it into perspective and with their informational writing. Other concepts are still too abstract for this.
  16. A more clearer perimeters to teach within.
  17. See above.
  18. Funding
  19. Adopt NGSS standards
  20. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
  21. no concerns
  22. Evolution section is weak and watered down. It needs to be strengthened.
  23. n/a
  24. No comment
  25. Please follow the National science education standards.
  26. The life cycle units are needed. The human body is great for second grade and very grade appropriate. If you want students to observe what heat does to matter, are you going to provide materials for experiments etc?
  27. I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.
  28. Also changes to L4 seem inappropriate. L4 should read "The unity and diversity of organisms, living and extinct, is the result of evolution", that is the current scientific consensus. Among scientists like myself there is no question that this is the overwhelming position, working in the word theory here is inappropriate and

"seeks to make clear" has nothing to do with science and has no place in the wording here.  
I propose the following improved wording.

L4. "All observable evidence shows us how the unity and diversity of organisms, living and extinct, is the result of evolution"

30. Do not attempt to deny or water down the concepts of evolution.
31. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
- 32.
33. This section is good
34. see above
35. I couldn't care less about Second Grade.
36. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
37. TEACH EVOLUTION!
38. N/A
39. If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
40. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
41. Stick to actual science and stop dumbing down our children!
42. Needs to go back to review.
43. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
44. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
- 45.
46. See previous comments on the treatment of evolutionary biology.
47. We should only be covering evolution in school. Creationism should be kept separate from schools.
48. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
49. Don't eliminate references to evolution, as it's necessary to understand life sciences.
50. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
51. Evolution must be taught.
52. An explanation of how life has evolved since living cells first populated the Earth must be included.

53. Send the standards back for review.
54. Explain evolution.
55. Include Evolution, omit ANY MENTION OF Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
56. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
57. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
58. Refer reply in 20 above.
59. ....
60. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
61. Continue to teach evolution. Do not remove it to teach creationism.  
Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
62. science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
63. Refer to my response to question 17.
64. DARWIN please.  
It is way too broad. The students that we are getting cannot possibly cover this much detail in a year long Biology class! I am National Board Certified and have taught for 16 years. Based on my experience, these standards will not lead to students grasping the all important "Big Picture." It will get lost in the details. In addition, it is a serious mistake to not place evolution at the center of any discussion of modern biology.
65. experience, these standards will not lead to students grasping the all important "Big Picture." It will get lost in the details. In addition, it is a serious mistake to not place evolution at the center of any discussion of modern biology.
66. Strengthen the teaching of evolution and global change to reflect the science of these subjects.
67. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
68. we should not eliminate detailed studies of evolution as it pertains to plants, animals and humans. These are scientific facts that must be taught.
69. Teach proper evolution
70. More dinosaur dioramas!
71. Evolution must continue to be taught
72. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.  
Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
73. all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
74. STOP calling Evolution a theory.
75. More on evolution.
76. L4
77. Evolution
78. All standards need to be included.
79. Evolution needs to be added back in as fact.
80. see previous comments.
81. See item 24.
82. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION

IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.

83. Adding and maintaining teaching Evolution needs to be continued.
84. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
85. Teach Science and facts in Schools not faith and religion.
86. N/A
87. No comment.
88. Fix evolution standards.
89. See comment #9
90. See first comment
91. **[No Answer Entered]**
92. Religion has no place undermining scientifically supported theory in SCIENCE CLASS
93. N/a
94. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
95. Only facts based on repeatable scientific tests.
96. Evolution should not be omitted or referred to as "theory."
97. Same as my earlier comments relating to removing the phrase "the theory of evolution" and keeping the single word "evolution"
98. Human factors on the environment should also be in this section.
99. The unity and diversity of organisms, living and extinct, is the result of evolution.
100. Please do not muddy the language regarding evolution  
Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
101. Please don't avoid education on evolution.
102. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
103. Teach Evolution
104. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
105. Revert all of Diane Douglas's changes.  
If the state allows teaching creationism, they will also have to teach other religion's creation myths,
106. such as Hopi, Navajo, Tohono Oodham, etc. For example, in the Maya creation myth, humans are created out of corn.
107. evolution should be included in all grades
108. They need to start learning about where they and everything came from, via evolution
109. Ditto
110. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
111. Evolution should be included in any life science or biological class.
112. 2.L2U1.10 - All energy ultimately comes from the sun. Therefore, it is unnecessary to state that life on Earth depends on energy from the sun and energy from other organisms. In fact, plants do not need energy from other organisms because they convert light energy from the sun into food energy.



Simplify this standard to read "Construct a model representing how life on Earth depends on energy from the Sun."

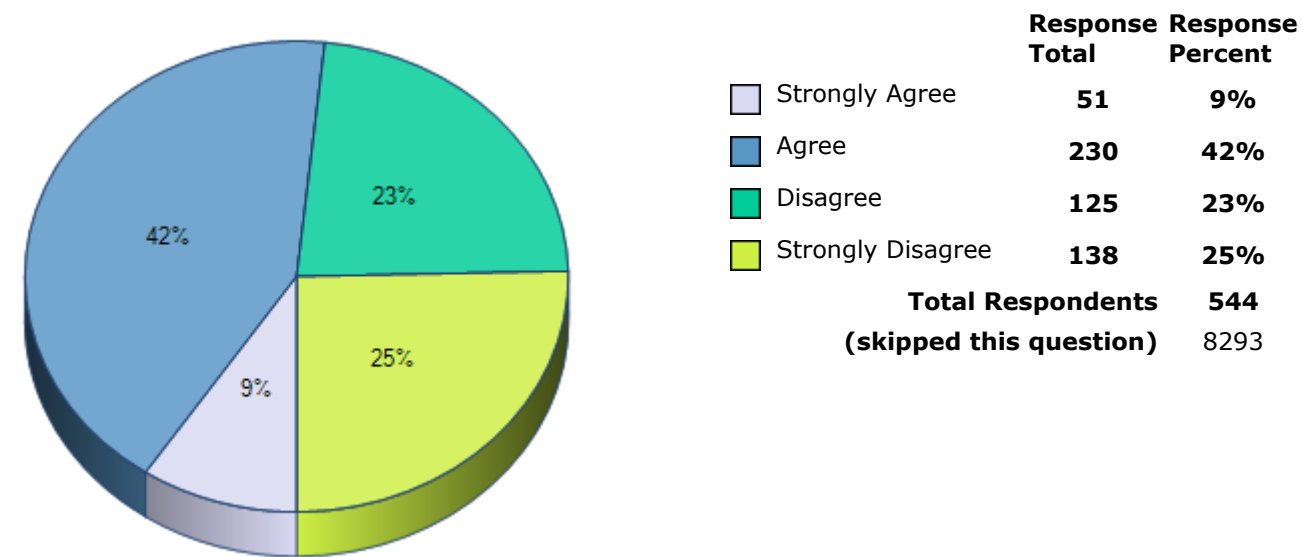
113. See above
114. Remove all religious references.
115. Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.
116. Evolution should not be omitted from this curricula.
117. Eliminate creationism, intelligent design. We get enough of this in church. Prepare the kids for college/trades schools with science.
118. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
119. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
120. Get a scientific expert to rewrite the content or undo the edits.
121. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.  
This applies to the "Distribution of K-2 standards" - page 20:  
" L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms."  
This is imprecise. In each section this should read "The study of evolution seeks to demonstrate..."  
First, evolution is an established scientific theory.  
A scientific theory differs from the "street" use of theory, which indicates a "guess" about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.
122. Two things distinguish evolution as a "scientific theory" from the more general use of "theory." First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven.  
Thus it is the STUDY of evolution – mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to "test" the underlying theory) – that have provided evidence of "the unity and diversity of living and extinct organisms."
123. Clearly include the teaching of the concept of evolution.
124. Comprehensive sex education is desperately needed in AZ schools.
125. Original language should remain
126. Teach evolution. Evolution is science.
127. We need to start teaching children about all aspects of life including evolution from the very beginning.
128. Just "Evolution," it is NOT a theory.
129. Evolution is not a theory.
130. No comment
131. That while people have widely different views on matters of faith, the scientific community is 99% percent in agreement that evolution is a demonstrable fact.
132. Only SCIENCE in Science class!
133. See kindergarten comments.
134. Environmental studies should include information regarding human impact.
135. See above
136. Get rid of "intelligent design." Restore references to evolution.

137. Don't teach 2nd  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or
138. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
139. Don't revise.  
Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the
140. replication of self copying dna in science labs and modern genetic engineering efforts is wrong.  
Period. Evolution through natural selection over millenia is a scientific fact.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering
141. down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
142. The inclusion of evolution must be reinstated.
143. Page 20, Table Row labeled L4 - see comment 19 - #4.
144. Evolution needs to be taught  
There is insufficient life science listed to be taught in second grade.
145. "Balance of nature" is a discredited concept that should not be taught. There is not a single balance point for each ecosystem, rather there are successional trajectories that vary with each system.
146. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
147. A second grader's level of understanding of the Theory of Evolution.
148. EVOLUTION
149. Teach our children science and not nonsense.
150. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually
151. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
152. See previous comments for earlier grades.
153. They can focus elsewhere with their improvements.
154. Please teach evolution and not creationism
155. Weather and mapping/GIS
156. SCIENTIFIC THEORY MUST BE TAUGHT
157. Teach evolution
158. As above
159. It's time, here, to start discussing the facts behind evolution, not just how different organisms interrelate to their environment.
160. This not the reason for my current comments.
161. Please don't change or revise the Second Grade 2018 Draft Life Science Standards
162. Keep religion out of public schools.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
163. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
164. Teach evolution as the foundation of biological science. Do not cover religion in public school standards as science.
165. No comment.

166. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
- Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start
167. up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty. Diane Douglas is an incompetent fool and her attack on science shows the type of moron that she is.
168. not enough detail
- Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
169. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
170. See comments above.
171. The language of section L4 implies an agenda of challenge to existing science
172. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
173. Introduction, in a very sensitive, to Gender and Sexuality.
174. no comment
175. See previous comments
176. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.
177. Keep all the standards
- I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
178. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
- It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
179. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
180. teach science not religious dogma
- Limiting the study of evolution to "the unity and diversity of living and extinct
181. organisms" is ludicrous. Fiction does not belong in science class, and the international scientific community (who have devoted their lives to studying science) is clear in their endorsement of the theory of evolution.
- Remove key concepts.
182. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
183. Do not present evolution as a theory.
184. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
185. Delete the words "theory of" in the Life Science section.
186. see above
187. Second grade science standards are adequate.
188. <https://www.nextgenscience.org/>
189. Nothing at this time.
190. Does not need any non scientific hypothesis such as creationism
191. See 19
192. More hands on learning.
193. conclusion: no religious....creationism...intelligent design in SCIENCE curriculum

194. Evolution should be taught, not creationism.
195. Teach that evolution is not a theory, but a fact.
196. Adopt NGSS!
197. Also, there are standards where there are no learning progressions listed in the Working With Big Ideas in Science and there are no standards where there are learning progressions.
198. Same
199. Must include concepts of evolution and must refer to Evolution by name.
200. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom!
201. See previous comments.
202. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom!
203. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
These comments are exclusively about the proposed adoption of "Intelligent Design" theory in the classroom. I'm sure you know about the federal court case ruling it unconstitutional, but I would like
204. to add that these kinds of ideas are what make Arizona's educational system the butt of so many jokes.  
What utter nonsense.
205. They look fine.
206. These are okay
207. The constitution
208. The constitution
209. See my comments in no. 15
210. same as above!!  
To whom it may concern,  
  
As an infectious disease doctor, my patients' lives and limbs depend on my science knowledge. Protecting our country from biological warfare attacks, disease outbreaks, foodborne illness, diseases affecting our crops and natural disasters will be difficult or impossible without a science-educated workforce.  
I feel that it is very important for our students to learn basic science, including facts about evolution, gene technology, global warming and vaccines without interference from religious extremists or science deniers.
211. Watering down science curriculum with religious nonsense does a disservice to our society, making our country less competitive with more reasonable nations, and less safe.  
  
Sincerely,  
  
Steven Oscherwitz MD  
Infectious Disease  
Tucson, Arizona
212. Keep the same sequence as the committee working group.
213. Not developmentally appropriate
214. keep evolution; reject intelligent design
215. include evolution as science
216. No Comment
217. na
218. N/A

**34.** The Third Grade Science Standards are appropriate for this grade level and complement the other Grades 3-5 Science Standards.



**35.** What would you like the working group to consider as they revise the Third Grade Science Standards?

Remove the wording "and parts of the human ear" isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.

1. Remove the wording "and parts of the human ear" isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
3. Better explanation the Using the Science core ideas. The other 10 "knowing" are understable. Is it not clear in the verbiage of the standard to how to use the science.
4. no suggestions
5. There needs to be resources given out if the students are to be taught this new information.
6. Wait to Test.
7. Nothing in particular.
8. Nothing
9. Adding more detailed information in the key concepts sections.
10. I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.
11. Page 9, 21, 33  
Remove last sentence: "Suggestions for key concepts...or maximum content limits."

Pages 12, 15, 19, 24, 28, 31, 37, 41, 45  
Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.

Remove additions by ADE: "and between content areas" and descriptions under third grade and fourth grade. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.

12. n/c
13. Integrate computer science and EIE instruction.
14. I would like the working group to look at the National Science and Technology Standards and base the standards on that.
15. What is developmentally appropriate for 8 and 9 year olds to understand  
Hands-on learning is very important for this age group  
Third graders are highly verbal and enjoy working with partners and small groups
16. Key Concepts should be expanded to provide more consistency in instruction across the state; with standards being broad, what is being taught may differ by site and location. How will testing be implemented without a better understanding of what is expected?
17. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
18. The Key concepts should be dropped from every grade level.
19. Simplification.
20. The concepts do not seem to flow, it is random content thrown under one huge heading "Physical Science".
21. I do not think that a third grader would find physical science engaging or interesting.
22. need more specifics
23. A more clearer perimeters to teach within.
24. The resources are the major concern and the physical science component is boring and not engaging.
25. this is to broad we need more specifics
26. Please provide a starting point. The Big Ideas are great, however there is a concern that information and concepts will be overlooked.
27. Funding
28. Really? how is a third grader supposed to "construct an explanation"...regarding the sun and the energy it supplies the earth. Once again, students this age are need science they can see, touch and feel.
29. I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.
30. Adopt NGSS standards
31. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
32. Consider the words being added to the Physical Science Standards, do these words change the standard from physical to life?  
The changes to page 21 are incorrect and lead to misconceptions - Return to original wording. We are not focusing on the sun but rather light and sound waves.  
PAGE 22 In this grade level, students apply their understanding of light waves; how they travel, are detected, and transfer energy to understand how light is a source of energy on Earth; how light and other waves travel, can be detected, and transfer energy; and how organisms can respond to light and other stimuli to increase their survival.
33. detected, and transfer energy to understand how light is a source of energy on Earth; how light and other waves travel, can be detected, and transfer energy; and how organisms can respond to light and other stimuli to increase their survival.
34. n/a
35. I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.
36. lots of science standards have changed and moved around - will there be curriculum and funding to accommodate these changes?
37. n/a
38. In 3.P2U1.1 in the key concepts it refers to characteristics of light such as speed. Are they really



- supposed to understand the speed of light at this grade level?
39. No comment
  40. Please follow the National science education standards.
  41. All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.
  42. Do not attempt to deny or water down the concepts of evolution.
  43. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
  44. 3.L2U2.7 requires students to do an experiment involving plants and animals. This means that teachers would have to incorporate live animals into the science lessons. For some of us this is not so easy to do. I personally am uncomfortable with keeping live animals in my classroom because I do not feel they can receive the proper amount of care required. So teaching this standard would be very difficult for me to do.
  45. This section is good
  46. More hands on standards - student will observe.
  47. You can talk about evolution. It's not voodoo! Keep christian beliefs out of science education.
  48. I couldn't care less about Third Grade.
  49. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
  50. Include health standard that includes body awareness pre puberty physical changes
  51. Senses have not been in standards since K-1
  52. TEACH EVOLUTION!  
In the section introduction: Why was the portion about light and sound waves removed? This statement addresses 3.P2U1.1, 3.P2U2.2, 3.P4U1.3 that are not addressed in the replacement sentence.
  53. 3.L1U1.5 does not fit with the summary statement at all.
  54. N/A
  55. Get rid of the "knowing and using science" and key concepts. Integrate more the three dimensions of "A Framework for K-12 Science Education."
  56. evolution rather than "theory of"  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
  57. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
  58. Stick to actual science and stop dumbing down our children!
  59. I would change back some of the original vocabulary terms used in 2004 explaining the Science Standards than the current
  60. Needs to go back to review.
  61. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
  62. Please revise.
  - 63.

64. Where is earth science? Plant science had been scaled bath to one item
  65. Evolution is not described nor incorporated accurately. This must be changed.
  66. No specific recommendations for this level
  67. We should only be covering evolution in school. Creationism should be kept separate from schools.
  68. Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)
  69. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
  70. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
  71. Send the standards back for review.
  72. Explain evolution.
  73. Include Evolution, omit Creationism and "Intelligent Design".
  74. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
  75. Change language in 3 L2u1.8 from use food chains... to use food webs- webs are more aligned with systems thinking, chains are more linear. Also, consider L2u3.9, change damaging effects of sunlight to damaging effects of drought (more relevant for AZ).
  76. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
  77. Refer reply in 20 above.
  78. You are only teaching parts of science.
  79. ....
  80. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
  81. More "Big Ideas" in science should definitely begin to be incorporated at this point.
  82. Continue to teach evolution. Do not remove it to teach creationism
  83. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
  84. Refer to my response to question 17.
  85. Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.
- The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.
- The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.
- The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.

86. Darwin, please.  
(My rating refers to Life Science standards)  
  
Page 21, the topic described for third grade matches exactly with what is actually listed in standards for second grade (2.L2U1.9 and 2.L2U1.10).
87. Page 25: The connection of the content taught with student's everyday life seems essential. Why is that deleted from the Introduction? It should be given extra prominence.  
The bold sentence seems deliberately modified to remove the idea that Earth resources are fuels and can be used up, replacing it with a bland statement that everything can be transformed into different forms of energy. Fossil fuels, for example, cannot be effectively be 'recreated' by transforming some other type of material/energy. The Earth, and life, have cycles, but not everything can be forever recycled.
88. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
89. Teach proper evolution
90. Evolution must continue to be taught
91. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.  
Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
92. all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
93. Very obvious that the Dept of Education is afraid of teaching young students how humans impact the Earth.
94. Encourage further development of experimental skills.
95. L4
96. Evolution
97. All standards need to be included.
98. No comment.
99. see previous comments.
100. The working group should consider both the opinion of experts in the field of science and the opinions of classroom teachers.
101. Add sustainability, social science
102. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
103. Adding and maintaining teaching Evolution needs to be continued.  
I would like to see more of the engineering design process and computational thinking to be included
104. in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!
105. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
106. Teach Science and facts in Schools not faith and religion.
107. Students need MORE SCIENCE in every level!
108. N/A
109. No comment.
110. Fix evolution standards.
111. See comment #9
112. See first comment
113. Light and sound should be taught as early as possible. I teach my 2 preschoolers about these concepts

- there's no reason to put it off.
114. No issues. Seems appropriate.
  115. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
  116. Additional material on rocks and minerals.
  117. More critical thinking.
  118. No need. Go with the scientific evidence not creationism or religious indoctrination!!
  119. Please do not muddy the language regarding evolution
  120. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
  121. Teach Evolution
  122. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
  123. Revert all of Diane Douglas's changes.
  124. evolution should be included in all grades
  125. Bring back the word "evolution."
  126. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
  127. See above
  128. Remove all religious references.
  129. Consider the claim that advances in science and technology produce products. There should be more emphasis on science and tech being used to understand complex processes and the natural world.
  130. Same as before.
  131. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
  132. The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.
  133. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
  134. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
  135. Get a scientific expert to rewrite the content or undo the edits.
  136. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
  137. Clearly include the teaching of the concept of evolution.
  138. Original language should remain
  139. Teach evolution. Evolution is science.
  140. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
  141. No comment
  142. That school is for teaching facts, not for promoting the views of any particular religious group.
  143. The teachers are not science teachers and will be concentrating getting the students to READ!
  144. See above

145. Get rid of "intelligent design." Restore references to evolution.
146. They are too broad. We need more specific goals.
147. Not utilize language in re Darwinism, natural selection or evolution.
148. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
149. Don't revise.
150. Any change in curriculum de-emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self-copying DNA in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millennia is a scientific fact.
151. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
152. 10. Page 21, 2nd paragraph – see comment 19 - #2
153. Evolution is not just a theory, it is well-established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards, not an improvement.
154. A third grader's level of understanding of the Theory of Evolution.
- This would be an agree without the ADE changes. Look at number of standards and grain size in this grade band compared to other grade bands.
- Connections to other academic disciplines.
- Remove entirely from the document. This belongs in a support document or curriculum adopted locally.
  - These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board.
  - Additionally, many of the connections cited don't actually align to the standards within the grade level.
- Key concepts Column
- What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level.
  - Remove the key concepts column from the document.
155. • If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards.
- Key concepts, if included, must represent concepts from all three dimensions, and not just the content of science.
- Below is an example for 3.L1U2.6. Follow this process for each of the third grade standards, not just the example below.
- Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions:
- Develop models to describe phenomena.
  - Science findings are based on recognizing patterns.
  - Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles.
  - Patterns of change can be used to make predictions.
156. Teach our children science and not nonsense.
157. That is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
158. They should consider not allowing Diane Douglas any say in revising the standards and revise them only to reflect scientific discoveries, not religious beliefs and pressure from right-wing political groups.
159. See previous comments for earlier grades.
160. They can focus elsewhere with their improvements.

161. I would like to see more animal standards.
162. Please teach evolution and not creationism
163. SCIENTIFIC THEORY MUST BE TAUGHT
164. Science, not creationism
165. Teach evolution
166. This not the reason for my current comments.
167. Please do not make any changes or revisions to Third Grade 2018 Draft Science Standards.
168. Keep evolution.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
169. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
170. No comment.
171. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
172. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
174. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
175. See comments above.
176. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
177. Continue to improve the content of the Second Grade standards.
178. Overall third grade sciences can be more complex to begin to introduce third graders to science
179. no comment
180. See previous comments
181. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
182. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
183. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
184. teach science not religious dogma  
I'm uncomfortable with inserting 'both positive and negative', while provocative, it implies that there
185. are only two impacts: positive and negative. There may be neutral and multi nuanced impacts. I think this inserts unnecessary false dichotomy.  
Remove key concepts.
186. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
187. Do not present evolution as a theory.



188. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
189. see above
190. Third grade science standards are adequate.
191. <https://www.nextgenscience.org/>
192. This is a new and different way of teaching science and teachers will need training, materials, and space.
193. Does not need any non scientific hypothesis such as creationism
194. See 19
195. Consider how to avoid having Diane Douglas ruin the work product.
196. More hands on learning. Focus on scientific data.
197. Evolution should be taught, not creationism.  
Seeing a learning progression of concepts would be very helpful to determine if these standards complement the other standards. Page 20 is not user friendly. Actually spelling out the standard would be more helpful. Using Science is essentially Nature of Science and does not need to be listed
198. as a table. The proposed key concepts column and connections to other disciplines should be rejected. As is stated on page 5 of the introduction, Standards are not curricular guides. Assessment boundaries might be more helpful. Integrating all cross cutting concepts would be more useful than focusing on one per grade level.
199. Teach that evolution is not a theory, but a fact.
200. Adopt NGSS!
201. No 'conclusions' or 'theories' should be presented that have not been arrived-at via use of The Scientific Method.
202. Keep what you have.
203. In general I think the deleted wording in the "DRAFT Released XXXX DRAFT" is generally to be preferred.
204. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
205. See previous comments.
206. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.  
Standard L4 currently reads: "The theory of evolution seeks to make clear the unity
207. and diversity of living and extinct organisms." This should be changed to "The theory of evolution explains the unity and diversity of living and extinct organisms."
208. These are largely adequate
209. No religion in school
210. The constitution
211. See my comments in no. 15  
Physical science standards again, as in K, are geared toward parts of the body in relation to sound
212. and light. The physical science aspect is lost as the focus becomes on life science concepts. Again, limited focus on motion of light and sound without exploring motion of other objects.  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
213. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
214. Next Generation Science Standards
215. Not developmentally appropriate
216. keep evolution; reject intelligent design

217. include evolution as science
218. My previous comments apply to all grade levels and the prescribed topics within the standards. I find them limiting and not based on children's enthusiastic inquiries into nature, space and technology.
219. na
220. n/a
221. N/A

**Total Respondents 221**

**36.** What would you like the working group to consider as they revise the Physical Science Standards in the Third Grade Science Standards?

1. Remove the wording "and parts of the human ear" isn't necessary and takes away from the idea of physical science. The body parts don't need to be explicitly connected for students and should be discovered through inquiry by students. This causes teachers to tell students more than necessary. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
  2. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
  3. Sound and light waves are an abstract concept that might have better success taught in 4th or 5th.
  4. no suggestions
  5. Wait to Test.
  6. Nothing in particular.
  7. What about animals adapting to the environment
  8. Nothing
- Page 22  
In the first paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for.
9. Remove Key Concept Columns
- Under 3.P2U1.1 - remove "parts of", and Under 3.P2U2.2 - remove "and parts of the human ear".  
What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
10. n/c
  11. I would like the working group to look at the National Science and Technology Standards and base the standards on that.
  12. Same as above
  13. I feel these standards are well written and easily understood by teachers.
  14. Simplification.
  15. Headings, big ideas, flow of concepts
  16. Concepts seems dull and boring
  17. A more clearer perimeters to teach within.
  18. They are not interesting to the average 8 year old nor are they engaging. the concepts are dull.
  19. Funding
  20. Adopt NGSS standards
  21. We should go back to the standards that the committee created and adopt those, not Diane Douglas's

- internal review copy.
- 3.P2U1.1  
"parts of" does not need to be added, we need students to understand how light is observed by our eyes but they do not need to be able to identify the different parts of the eye
22. I also fear that adding this could change the standard from physical to life
- 3.P2Us.2  
and parts of the human ear...again this may change the meaning of the original standard which is based
23. Leave out the life science from this standard. Take out and parts of human eye, human ear etc.
24. n/a
25. I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.
26. n/a
27. No comment
28. Do not attempt to deny or water down the concepts of evolution.
29. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
30. This section is good
31. see above
32. I couldn't care less about Third Grade.
33. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
34. 3.P2U1.1 This changes the standard from physical science to life science as the structure and function of the eye is introduced.  
3.P2U2.2 This changes the standard from physical science to life science as the structure and function of the ear is introduced.
35. N/A
36. In 3.P2U1.1 - why add "and parts of the human eye"? how light behaves is an important concept in and of itself. to add the lenses and the human eye complicates the standard - and it does not have to. Same with 3.P2U2.2 with sound and human ear.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
37. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
38. Stick to actual science and stop dumbing down our children!
39. Needs to go back to review.
40. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
41. Please revise.
42. Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
43. We should only be covering evolution in school. Creationism should be kept separate from schools.
44. "parts of human eye"/"parts of human ear" - delete. The students knowing of the parts would be a life science standard and better fit in health standards.

45. Evolution must be taught
46. Send the standards back for review.
47. Explain evolution.
48. Include Evolution, omit Creationism and "Intelligent Design".
49. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
50. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
51. Refer reply in 20 above.
52. ....
53. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
54. Continue to teach evolution. Do not remove it to teach creationism.
55. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
56. Refer to my response to question 17.
57. 3.P4U1.3 seems to advanced
58. Teach proper evolution
59. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
60. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
61. Ambivalent.
62. Evolution
63. All standards need to be included.
64. No comment.
65. see previous comments.
66. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
67. Adding and maintaining teaching Evolution needs to be continued.
68. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
69. Teach Science and facts in Schools not faith and religion.
70. N/A
71. No comment.
72. Fix evolution standards.
73. See comment #9
74. The addition of "closed system" is a good edit and increases the accuracy of the statement.
75. N/a
76. Only facts based on repeatable scientific tests.
77. No need. Go with the scientific evidence not creationism or religious indoctrination!!

78. Please do not muddy the language regarding evolution
79. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
80. Teach Evolution
81. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
82. Revert all of Diane Douglas's changes.
83. evolution should be included in all grades
84. Ditto
85. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
86. Discussion of climate change should be included in the standards.
87. See above
88. Remove all religious references.
89. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.  
"Collect data and construct arguments based on evidence to explain how sound waves affect objects at varying distances and parts of the human ear."
90. It is not developmentally appropriate that third graders be examining parts of the human eye or ear.
91. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
92. Get a scientific expert to rewrite the content or undo the edits.
93. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
94. Clearly include the teaching of the concept of evolution.
95. Original language should remain
96. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
97. No comment
98. That school is for teaching facts, not for promoting the views of any particular religious group.
99. See above.
100. See above
101. Get rid of "intelligent design." Restore references to evolution.
102. Make the standards not so broad.  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
103. Don't revise.
104. Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the

- replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
108. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
109. Page 32, Table, Row labeled P4 – see comment 19 - #3.
110. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
111. A third grader's level of understanding of the Theory of Evolution.
112. Standards 1 and 2: Adding "parts of the human" to the standard changes the focus from a physical science emphasis understanding properties of light and sound to a life science focus understanding functionality of organs.
113. Teach our children science and not nonsense.
114. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
115. The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
116. See previous comments for earlier grades.
117. They can focus elsewhere with their improvements.
118. Please teach evolution and not creationism
119. SCIENTIFIC THEORY MUST BE TAUGHT
120. Teach evolution
121. This not the reason for my current comments.
122. Please do not make any changes or revisions to Third Grade 2018 Draft Science Standards.
123. Keep evolution.
124. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
125. No comment.
126. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
127. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
128. not enough detail
129. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
130. See comments above.
131. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
132. Again, continue to improve the content of the Second Grade standards.
133. no comment
134. See previous comments



135. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
136. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
137. Be accurate and rigorous in addressing the origins of the universe.
138. teach science not religious dogma  
Remove key concepts.
139. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
140. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
141. see above
142. Third grade science standards are adequate.
143. <https://www.nextgenscience.org/>
144. Does not need any non scientific hypothesis such as creationism
145. See 19
146. More hands on learning.
147. Evolution should be taught, not creationism.
148. Adopt NGSS!
149. If iit's working well, don't fix it.
150. See previous comments.
151. These are adequate
152. Teligepm should be learned in church
153. The constitution  
Physical science standards again, as in K, are geared toward parts of the body in relation to sound
154. and light. The physical science aspect is lost as the focus becomes on life science concepts. Again, limited focus on motion of light and sound without exploring motion of other objects.  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
155. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
156. Not developmentally appropriate
157. keep evolution; reject intelligent design
158. include evolution as science
159. Same
160. na
161. N/A

**Total Respondents 161**

**37.** What would you like the working group to consider as they revise the Earth and Space Science Standards in the Third Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
3. Solar system-planets in 3rd grade?
4. no suggestions
5. Wait to Test.
6. Nothing in particular.
7. why just sun energy? CKLA also has the planets
8. Nothing  
Page 22
9. Remove Key Concept Columns
10. n/c
11. I would like the working group to look at the National Science and Technology Standards and base the standards on that.
12. Same as above
13. The Earth/Space Science standard seems out of place as it does not tie in with other science learning.
14. Simplification.
15. Earth and Space Science are both fun and intriguing for 8 and 9 year olds
16. A more clearer perimeters to teach within.
17. I think this one was well done.
18. Funding
19. Please revisit rocks and minerals and the energy it takes to create and destroy them! Or how about the energy humans receive by consuming minerals in their daily diets.
20. Adopt NGSS standards
21. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
22. nothing
23. n/a
24. I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.
25. n/a
26. No comment
27. Same comments as 2nd grade
28. Do not attempt to deny or water down the concepts of evolution.
29. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
- 30.

31. Add more here. Kids that age generally like dinosaurs and fossils. Use this to begin a discussion of geologic time and how fossils form. You use fossils for the fourth grade.
32. This section is good
33. see above
34. I couldn't care less about Third Grade.
35. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
36. TEACH EVOLUTION!
37. N/A  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
38. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
39. Stick to actual science and stop dumbing down our children!
40. Needs to go back to review.
41. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
42. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
- 43.
44. Evolution is not described nor incorporated accurately. This must be changed.
45. We should only be covering evolution in school. Creationism should be kept separate from schools.
46. Send the standards back for review.
47. Explain evolution.
48. Include Evolution (where relevant), omit Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
- 49.
50. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
51. Refer reply in 20 above.
52. ....
53. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
54. Continue to teach evolution. Do not remove it to teach creationism.
55. Evolution!  
Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
- 56.
57. Refer to my response to question 17.
58. Teach proper evolution

59. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
60. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
61. Ambivalent.
62. Evolution
63. All standards need to be included.
64. No comment.
65. see previous comments.
66. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
67. Adding and maintaining teaching Evolution needs to be continued.
68. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
69. Teach Science and facts in Schools not faith and religion.
70. N/A
71. No comment.
72. Fix evolution standards.
73. See comment #9
74. N/a
75. Only facts based on repeatable scientific tests.
76. Arizona is blessed with rich geologic formations that are exposed for easy study and exploration. The third grade earth and space standards need to focus more heavily on rocks and minerals as they relate to Arizona geology.
77. No need. Go with the scientific evidence not creationism or religious indoctrination!!
78. Please do not muddy the language regarding evolution
79. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
80. Teach Evolution
81. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
82. Revert all of Diane Douglas's changes.
83. evolution should be included in all grades
84. Not Enough! Is this really all you're going to teach. How long will that take? I can teach a kid this in 5 min tops. This is where you should keep re-emphasizing wind, water and then sun as well. Just cover renewable energy and extend it to plants to get that point across too. Plants and solar panels really aren't that different are they? they gather photons (depending on the panel) for energy. They just have different parts to do it.
85. Ditto
86. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
87. Big Bang Cosmology and Climate Change should be part of any earth and space sciences curriculum and standards.
88. 3.E1U1.4 seems like a rewording of 2.L2U1.10. Is this standard supposed to suggest that students explore how the sun drives movements in the atmosphere and hydrosphere? Note that internal heat

the Earth's core is also a significant source of energy and drives plate movements, so I think some clarification is needed about what is meant by "primary."

89. See above
90. Remove all religious references.
91. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
92. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
93. Get a scientific expert to rewrite the content or undo the edits.
94. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
95. Clearly include the teaching of the concept of evolution.
96. Original language should remain
97. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
98. No comment
99. That school is for teaching facts, not for promoting the views of any particular religious group.
100. See above.
101. See above
102. Get rid of "intelligent design." Restore references to evolution.
103. Be more specific with each standard  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
104. Don't revise.  
Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
105. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
106. Please include climate change
107. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
108. A third grader's level of understanding of the Theory of Evolution.
109. Teach our children science and not nonsense.
110. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
111. The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.

116. See previous comments for earlier grades.
117. They can focus elsewhere with their improvements.
118. Please teach evolution and not creationism
119. SCIENTIFIC THEORY MUST BE TAUGHT
120. Teach evolution
121. This not the reason for my current comments.
122. Please do not make any changes or revisions to Third Grade 2018 Draft Earth and Space Science Standards.
123. Keep evolution.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
124. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
125. No comment.
126. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
127. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
128. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
129. See comments above.
130. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
131. More about our earth and other planets.
132. no comment
133. See previous comments  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
134. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
135. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
136. Be accurate and rigorous in addressing climate science and the role of humans
137. teach science not religious dogma  
Remove key concepts.
138. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
139. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
140. see above
141. Third grade science standards are adequate.
142. <https://www.nextgenscience.org/>
- 143.



144. Does not need any non scientific hypothesis such as creationism
145. See 19
146. More hands on learning.
147. Evolution should be taught, not creationism.
148. Adopt NGSS!
149. Same as above.
150. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
151. See previous comments.
152. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
153. These are adequate
154. The constitution
155. The constitution
156. Again, a solitary, isolated standard. Include additional standards that relate (i.e. weather)  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
157. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
158. Not developmentally appropriate
159. keep evolution; reject intelligent design
160. include evolution as science
161. Same
162. na
163. N/A

**Total Respondents    163**

**38.** What would you like the working group to consider as they revise the Life Science Standards in the Third Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
3. Seems heavier than the other two. Should they be equally weighted?
4. no suggestions
5. Wait to Test.
6. Nothing in particular.
7. Just have the eye and ear for the human body since it goes with light and sound energy
8. Nothing
9. Page 23  
Remove Key Concept Column

Remove 3.L1U1.5 - since it is in green, the teacher's did not indicate that this is a standard that should be taught at the 3rd grade level. Renumber 6 through 9 to be 6 through 8.

10. n/c
11. I would like the working group to look at the National Science and Technology Standards and base the standards on that.
12. Same as above
13. The introduction of 3.L1U1.5 feels out of alignment with the other 4 standards that focus on plants/animals. 3.L2U3.9 also feels like it has been tacked on even though it doesn't fit well.
14. Simplification.
15. What human body systems? Also, this concept could be taught the entire year. Then it goes into plans and the food chain. How do these concepts flow. they are not cohesive.
16. Life Science is has clear concepts and standards. Kids will enjoy this unit.
17. A more clearer perimeters to teach within.
18. This one is done fine.
19. Funding
20. Adopt NGSS standards
21. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
22. nothing
23. 3.L1u1.5 in reading the header the life science focus is on energy and specialized features for survival not random "know the body parts/systems and how they carry out life processes"
24. Evolution section is weak and watered down. It needs to be strengthened.
25. I would like the group to consider what type of curriculum we will be receiving to follow so that we are able to sufficiently teach the new standards.
26. n/a
27. No comment
28. I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.
29. Do not attempt to deny or water down the concepts of evolution.
30. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
31. See #38 above. Also, you may want to reword 3.L2U2.7 so you are more specific about the type of stimuli. As it reads now, it seems like we're encouraging students to harm animals "in the name of science."
32. This section is good
33. see above
34. I couldn't care less about Third Grade.
35. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.  
3.L1U1.5 This standard is not related to the other standards in the draft, does not fit the summary of the grade level, does not address the phenomenon of cause and effect OR energy and matter AND it appears to have been pulled from the Core Knowledge curriculum document.
36. 3.L2U3.9 Are we advocating testing on animals? In order to show that a solution REDUCES damage, there must be a control. In other words, some organisms would have to be purposefully exposed to damaging conditions to be a point of comparison. This is unethical and has no place in an elementary classroom.
37. N/A

38. If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
39. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
40. Stick to actual science and stop dumbing down our children!
41. Needs to go back to review.
42. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
43. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
44. See previous comments on the treatment of evolutionary biology.
45. Evolution is not described nor incorporated accurately. This must be changed.
46. We should only be covering evolution in school. Creationism should be kept separate from schools.
47. 3.L1U1.5 - not appropriate for this age level - delete. In Working with Big Ideas, this concept can be found on pg 26 for 11-14 years olds - not 3rd graders.
48. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
49. Don't eliminate references to evolution, as it's necessary to understand life sciences.
50. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
51. Send the standards back for review.
52. Explain evolution.
53. Include Evolution, omit ANY MENTION OF Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
54. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
55. Refer reply in 20 above.
56. ....
57. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
58. Continue to teach evolution. Do not remove it to teach creationism.
59. include evolution  
Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation.
60. Refer to my response to question 17.
61. 3.L2U2.7 could go very badly. I'd specify specific stimuli, like light/dark, which would tie nicely into 3.L2U3.9

65. Darwin, please.
66. Introduce the theory of evolution at this level.
67. Strengthen the teaching of evolution and global change to reflect the science of these subjects.
68. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
69. Teach proper evolution
70. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
71. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
72. STOP calling Evolution a theory.
73. As before, more on evolutionary theory.
74. L4
75. Evolution
76. All standards need to be included.
77. decomposers
78. Evolution needs to be added back in as fact.
79. see previous comments.
80. Be wary of wording about "theories" and "beliefs". If a "theory" has been widely observed to be true over an extensive period of time, it is for all effects and purposes "scientific fact". (See the National Academy of Sciences comments about "Is Evolution a Theory or a Fact?") Beliefs can be held without evidence--science is by nature evidentiary.
81. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
82. Adding and maintaining teaching Evolution needs to be continued.
83. nothing - it is well written and includes evolution as a science topic.
84. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
85. Teach Science and facts in Schools not faith and religion.
86. N/A
87. No comment.
88. Fix evolution standards.
89. See comment #9
90. Knock it off with these silly changes that are less accurate
91. N/a
92. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
93. Only facts based on repeatable scientific tests.
94. See my comments in Question 15
95. The unity and diversity of organisms, living and extinct, is the result of evolution.
96. No need. Go with the scientific evidence not creationism or religious indoctrination!!
97. Please do not muddy the language regarding evolution

98. Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
- Please don't avoid education on evolution.
99. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
100. Teach Evolution
101. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
102. Revert all of Diane Douglas's changes.
103. evolution should be included in all grades
- The body systems are taught in third grade science per this draft. I looked through the rest of the life science standards and DID NOT SEE THEM IN ANY OTHER GRADE LEVEL. They used to be in 5th and 6th grade and at a secondary level in high school biology/anatomy classes. Why third grade? And are they supposed to remember them without being readdressed until collegiate level classes? Body systems could be taught in third grade, but should definitely appear somewhere else later on in more specific detail and terms.
- 104.
105. They need to start learning about where they and everything came from, via evolution
106. Ditto
107. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
108. Evolution should be included in any life science or biological class
- 3.L1U1.5 is the same as and has the same problem as K.L1U1.5. Why is this standard in both places? If you want to have a progression, then 3.L1U1.5 needs to include some additional sophistication that builds on K.L1U1.5.
- 109.
- 3.L2U1.8 - I think the word "exchange" is inaccurate in this standard. The standard should read "Use food chains as system models to describe the flow of energy from the sun to plants to animals."
- Standard 3.L2U1.8 seems to not be in the same developmental level as the others. The key concepts for the first standard make more sense for this than those presented for this standard. I am unsure how classification of animals as omnivores, herbivores, etc. correlated to explaining and creating for models for different processes carried out by animals.
- 110.
111. See above
112. Remove all religious references.
113. Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.
114. Evolution should not be omitted from this curricula.
115. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
116. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
- The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
- 117.
118. Get a scientific expert to rewrite the content or undo the edits.
119. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
120. What follows is repeated for grades 3-5 and is based on the "Distribution..." Table:  
" L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms."  
This is imprecise. In each section this should read "The study of evolution seeks to demonstrate..."  
First, evolution is an established scientific theory.

A scientific theory differs from the "street" use of theory, which indicates a "guess" about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.

Two things distinguish evolution as a "scientific theory" from the more general use of "theory." First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven.

Thus it is the STUDY of evolution – mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to "test" the underlying theory) – that have provided evidence of "the unity and diversity of living and extinct organisms."

121. Clearly include the teaching of the concept of evolution.
122. Original language should remain
123. Teach evolution. Evolution is science.
124. We need to start teaching children about all aspects of life including evolution from the very beginning.
125. No comment
126. That school is for teaching facts, not for promoting the views of any particular religious group.
127. See above.
128. Environmental studies should include information regarding human impact.
129. See above  
Those writing these standards should be experts in science and/or education.  
  
At a minimum they should understand what the word "THEORY" means in scientific terms.
130. Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"  
Those writing these standards should be experts in science and/or education.  
  
At a minimum they should understand what the word "THEORY" means in scientific terms.
131. Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
131. Get rid of "intelligent design." Restore references to evolution.  
Make the standards a lot more specific. We need longer than just this next two months to have the
132. standards ready to work on with the students in our classes. We need another year to work on them before we present them to the students.
133. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
134. Don't revise.
135. Na  
Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
136. down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
137. The inclusion of evolution must be reinstated.
138. Page 32, Table, Row labeled L4 – see comment 19 - #4.
139. Please include evolution



140. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
141. A third grader's level of understanding of the Theory of Evolution.
142. Standard 5 does not add anything that isn't already in standard 6. Not sure what students would be evaluating.
143. Teach our children science and not nonsense.
144. That intelligent Design is just one of several approaches to Life Science, and not the exclusive nor irrefutable means to explain development of any forms of life.
145. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
146. The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
147. See previous comments for earlier grades.
148. Again, why are microbes omitted from these lessons? They are the largest branch of life. Kids love looking under microscopes!
149. They can focus elsewhere with their improvements.
150. Please teach evolution and not creationism
151. SCIENTIFIC THEORY MUST BE TAUGHT
152. Teach evolution
153. As above
154. More coverage of the E-word here, please.
155. This not the reason for my current comments.
156. Please do not make any changes or revisions to Third Grade 2018 DraftLife Science Standards.
157. Evolution.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
158. No comment.
159. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
160. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
161. See comments above.
162. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
163. More, appropriately, about Gender and Sexuality.
164. no comment
165. See previous comments
166. Referring to evolution as only a "theory" when the vast majority of all biological standards we know

- and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined.
170. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
  171. It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
  172. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
  173. Accurately describe the theory of evolution and natural selection
  174. teach science not religious dogma  
Remove key concepts.
  175. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
  176. Do not present evolution as a theory.
  177. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
  178. Delete the words "theory of" in the Life Science section L4.
  179. see above
  180. Third grade science standards are adequate.
  181. Drop theory of evolution.
  182. <https://www.nextgenscience.org/>
  183. Does not need any non scientific hypothesis such as creationism
  184. See 19
  185. Keep only evolutionary learning at this level. Otherwise it gets confusing.
  186. conclusion: no religious...creationism...intelligent design in SCIENCE curriculum
  187. Evolution should be taught, not creationism.
  188. Teach that evolution is not a theory, but a fact.
  189. Adopt NGSS!
  190. Same
  191. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
  192. See previous comments.
  193. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom!
  194. "Obtain, evaluate, and communicate how the human body has different systems that carry out life processes." This sentence doesn't even make sense. Maybe "obtain evidence" is what was intended here?
  195. The constitution
  196. The constitution
  197. See my comments in no. 15
  198. Standard on human body systems (3.L1U1.5) guides teachers to having students memorize body system facts in isolation. Body systems should be addressed through the other standards:

internal/external structures, reactions to stimuli, energy exchange, etc.

To whom it may concern,

As an infectious disease doctor, my patients' lives and limbs depend on my science knowledge. Protecting our country from biological warfare attacks, disease outbreaks, foodborne illness, diseases affecting our crops and natural disasters will be difficult or impossible without a science-educated workforce.

I feel that it is very important for our students to learn basic science, including facts about evolution, gene technology, global warming and vaccines without interference from religious extremists or

199. science deniers.

Watering down science curriculum with religious nonsense does a disservice to our society, making our country less competitive with more reasonable nations, and less safe.

Sincerely,

Steven Oscherwitz MD  
Infectious Disease  
Tucson, Arizona

Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.

201. Not developmentally appropriate

202. keep evolution; reject intelligent design

203. include evolution as science

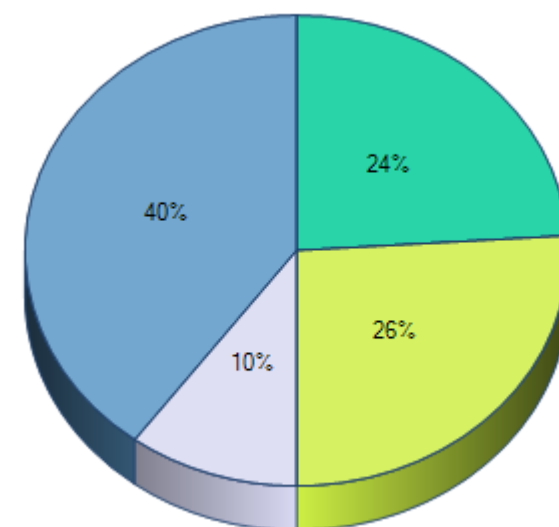
204. Same

205. na

206. N/A

**Total Respondents 206**

**39.** The Fourth Grade Science Standards are appropriate for this grade level and complement the other Grades 3-5 Science Standards.



	Response Total	Response Percent
Strongly Agree	55	10%
Agree	216	40%
Disagree	130	24%
Strongly Disagree	141	26%
<b>Total Respondents</b>	<b>542</b>	
<b>(skipped this question)</b>	8295	

**40.** What would you like the working group to consider as they revise the Fourth Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.

2. The 4th grade Earth and Space science standards are fantastic. They support rigor and critical thinking.
3. Please be aware of the testing expectations for this grade when planning the curriculum map.
4. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
5. Keep U standards in each standard. Offer more questioning to cause deeper learning.  
Take out any reference to scientific method  
Concepts taught in 1.P3U1.3 and magnet composition, magnetic: forces, poles, fields, attraction, static electricity, electric current, circuits, conductors, insulators, electromagnets, electrical charge
6. (protons, electrons), safety Magnetic composition for fourth grade is not age appropriate. Magnetism is the result of the atoms of the matter behaving a particular way which is not appropriate at this grade.
7. no suggestions
8. Wait to Test.
9. Basically, the 6th grade articulated standards are moving into the 4th grade crosscutting standards.
10. Nothing in particular.
11. Nothing  
I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.  
Page 9, 21, 33  
Remove last sentence: "Suggestions for key concepts...or maximum content limits."
12. Pages 12, 15, 19, 24, 28, 31, 37, 41, 45  
Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.
13. Page 21  
Remove additions by ADE: "and between content areas" and descriptions under third grade and fourth grade. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
14. n/c
15. Our team thought that some of the standards in the content area would be a little challenging for our population.
16. I like the overall tie-in to energy, gives a consistent feel to the standards.
17. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
18. The Key concepts should be dropped from every grade level.
19. Simplification.
20. The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.
21. A more clearer perimeters to teach within.  
At this time, we do not have considerations, since expectations are pinpointed and standards build upon grade levels before. Common language is helpful for student learning and high school preparation.
22. at this time there is nothing that I feel they need to consider, since they had pin pointed their expectations.
23. Funding
24. I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.
- 25.

26. Adopt NGSS standards
27. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.  
Please read from MIT "Magnetism is a force, but it has no energy of its own," says David Cohen-Tanugi, vice president of the MIT Energy Club and a John S. Hennessy Fellow in MIT's Materials Science and Engineering department. Still, he adds, "magnetism is extremely useful for converting energy from one form to another. About 99% of the power generated from fossil fuels, nuclear and hydroelectric energy, and wind comes from systems that use magnetism in the conversion process." Magnetism is NOT energy it is a force.
- 28.
29. n/a
30. n/a
31. The statement for the 4th grade standard is INCORRECT in Physical Science.
32. The rock cycle should remain in third grade and 4th should continue to teach the weather unit and water cycle.
33. The scientific method needs to be included.
34. page 26 - 4.E1U2.6 - "support an argument on whether ....provide evidence" - this statement is counterintuitive. These things listed DO provide evidence for this concept. This statement should read something more along the lines "obtain and analyze evidence that support past plate movement..."
35. The draft of science standards is fine. I understand that rocks are normally taught in 3rd grade, however I think that they align with 4th grade standards.
36. See my previous comments
37. All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.
38. Do not attempt to deny or water down the concepts of evolution.
39. Standard 4.E1U1.5's key concepts are too difficult for this grade level.
40. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
41. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
42. Students should be taught how the energy for electricity is obtained. Magnetic currents don't exist.
43. too watered down
44. see above
45. I couldn't care less about Fourth Grade.
46. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
47. Include health standard that includes body awareness pre puberty physical changes especially for girls
48. Again, are there resources that districts will be able to purchase that align to the content at each grade level?
49. TEACH EVOLUTION!
50. In the section introduction: This statement does not provide an overview of the 4th grade standards.

On Page 25, when this section "students expand on the idea that energy from the Sun interacts with Earth systems and explore other forms of energy we use in everyday life. Students apply their understanding of the various Earth systems (geosphere, hydrosphere, atmosphere, biosphere) and how they interact with each other and heat from the Sun. Students understand how geological

systems change and shape the planet and provide the resources for fuels. Students also develop an understanding how Earth processes and human interactions can change environments impacting the ability for organisms to survive." Was condensed to "Students also understand how weather, climate, human interactions, and geological systems change and shape the earth and the factors impacting organism diversity", clarity was lost.

51. Restore 4.L4U4.12 to original terminology.
52. Get rid of the "knowing and using science" and key concepts. Integrate more the three dimensions of "A Framework for K-12 Science Education."
53. evolution rather than "theory of"  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
54. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
55. Stick to actual science and stop dumbing down our children!
56. Needs to go back to review.
57. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
58. Please revise.
59. Evolution is not described nor incorporated accurately. This must be changed.  
Stronger emphasis on the scientific method. This is the stage when students can be made explicitly aware of the scientific method. It can be exciting for children to be exposed to the idea that there is a standard set of steps they can use to test their impressions about the natural world, to tell if a statement is true or false. This is a good time to learn that personal impression can be misleading, and that science provides a way to tell if they are being "tricked" by their own senses.
60. We should only be covering evolution in school. Creationism should be kept separate from schools.  
Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)
61. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
62. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
63. Send the standards back for review.
64. Explain evolution.
65. Include Evolution, omit Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
66. Reinstate evolution.
67. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
68. Refer reply in 20 above.
69. ....
70. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
71. Continue to teach evolution. Do not remove it to teach creationism.
72. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism.



Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.

76. Refer to my response to question 17.

Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.

77. The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.

The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.

The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.

78. Darwin, please.

My rating reflects Life Science Standards

L4

Generally the life science standards seem less ties to the overall topics of the year and less ambitious, for third and fourth grade.

79. In particular, with the focus in fourth grade on systems, it would be natural to talk more about ecological systems, food webs, connecting life cycles or food webs with cycles of water and energy on ecosystem scales, or talking about how food webs create interdependent communities, or how resources cycling also implies that one change in a resource or organism can impact many others. None of this seems to be mentioned anywhere in standards up to fourth grade despite such a focus on food chains and cycles for water and energy in standards

80. Although I am not an elementary school teacher, I suggest that the Theory of Evolution be introduced by the fourth grade at the latest.

81. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.

82. Teach proper evolution

83. This is where evolution should be introduced

84. Evolution must continue to be taught

85. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.

86. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.

Put back what Dept of Education crossed out in paragraph 1 on page 25.

87. On pg 27, L4U4, put back the original language and stop insinuating that there is evidence to refute Evolution. Remove "argument" from the text.

88. Student-led experiments and sharing of said experiments.

89. L4

90. Evolution

91. All standards need to be included.

92. No comment.

93. see previous comments.

94. See item 38 and 41 above.

95. Add social sciences and sustainability
96. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
97. Adding and maintaining teaching Evolution needs to be continued.  
I would like to see more of the engineering design process and computational thinking to be included
98. in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!
99. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
100. Teach Science and facts in Schools not faith and religion.
101. Students need MORE SCIENCE in every level!
102. N/A
103. No comment.
104. Fix evolution standards.
105. See comment #9  
The bullet point about 4th grade specifically on page 21. I feel the crossed out verbiage is preferable
106. because it clearly indicated that there are cause and effect relationships between changes of resources and survival. Same thing goes for the crossed out verbiage on the top of page 25.
107. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
108. More critical thinking.
109. No need. Go with the scientific evidence not creationism or religious indoctrination!!
110. Please do not muddy the language regarding evolution
111. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
112. Teach Evolution
113. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
114. Revert all of Diane Douglas's changes.
115. evolution should be included in all grades  
Ok...so suddenly we switch to natural disasters after the whole energy thing. I'm fine with that. Whatever;but...do you even know what geosphere is? Why did you list parts of it afterwards...I think
116. it's cause you didn't know what else to do. It's like me saying...I'm going to teach about a water bottle and also I'm going to teach a whole separate topic of the water bottle cap...and how they're connect...ya...that was hard to figure out. These topics are too verbose and they look like a lot but they really aren't.
117. They need to start learning about where they and everything came from, via evolution
118. Bring back the word "evolution."
119. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
120. Climate change, evolution, and big bang cosmology should be in these standards.  
It seems that as with the current science standards, there is more content in 4th grade (12
121. standards) than 3rd or 5th grade. Is it possible to reduce some of the standards in 4th grade or distribute them to 3rd grade (only 9 standards)?
122. See comments from previous re: 4.L4U4.12
123. See above
124. Remove all religious references.
125. Consider the claim that advances in science and technology produce products. There should be more

- emphasis on science and tech being used to understand complex processes and the natural world.
126. 4.E1U2.6 seems very similar to the added 7th grade standard: 7.E1U2.5 -- the 7th grade standard is printed in green. Should one of these be revised or deleted?
- Omits the need to look at energy critically and how the Earth's systems interact with each other. The
127. key concepts go off on tangents not related to the standard or put an unnecessary focus on irrelevant aspects of the standard.
128. Same as before.
129. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
130. The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.
131. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
132. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
133. Get a scientific expert to rewrite the content or undo the edits.
134. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
135. Clearly include the teaching of the concept of evolution.
136. Original language should remain
137. Teach evolution. Evolution is science.
138. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
139. No comment
140. That school is for teaching facts, not for promoting the views of any particular religious group.
141. See above.
142. See above
- Those writing these standards should be experts in science and/or education.
143. At a minimum they should understand what the word "THEORY" means in scientific terms.
- Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
144. Get rid of "intelligent design." Restore references to evolution.
145. I don't teach 4th
146. Not utilize language in re Darwinism, natural selection or evolution.
147. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
148. Don't revise.
149. Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
150. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a

disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.

151. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.

152. A fourth grader's level of understanding of the Theory of Evolution.

This would be an agree without the ADE changes. Look at number of standards and grain size in this grade band compared to other grade bands.

Connections to other academic disciplines.

- Remove entirely from the document. This belongs in a support document or curriculum adopted locally.
- These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board.
- Additionally, many of the connections cited don't actually align to the standards within the grade level.

Key concepts Column

- What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level.
  - Remove they key concepts column from the document.
  - If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards.
153. Key concepts, if included must represent concepts from all three dimensions, and not just the content of science.

Below is an example for 4.E1U2.7 Follow this process for each of the fourth grade standards, not just the example below.

Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions:

- Identify the evidence that supports particular points in an explanation.
- Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.
- Patterns can be used as evidence to support an explanation.
- Science assumes consistent patterns in natural systems.

154. Teach our children science and not nonsense.

155. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.

156. They should consider not allowing Diane Douglas any say in revising the standards and revise them only to reflect scientific discoveries, not religious beliefs and pressure from right-wing political groups.

157. See previous comments for earlier grades.

158. They can focus elsewhere with their improvements.

159. Please teach evolution and not creationism

160. SCIENTIFIC THEORY MUST BE TAUGHT

161. Science, not creationism.

162. Teach evolution

163. This not the reason for my current comments.

164. Please do not make any changes or revisions to Fourth Grade 2018 Draft Science Standards.

165. I like the fact that the unit on cells and plants has been moved to other grade levels as this is a heavy unit along with other heavy units like weather and earth units. I really feel that not every unit should be large and cumbersome. A few is okay.

166. Keep evolution.  
Page 25 It seems the elimination of the area in the paragraph starting with "students expand on the idea that energy...ending with "ability for organisms to survive" should be left in place. Again, this
167. seems to be watering down of accepted science research in a thinly veiled attempt to allow non scientific methods to be taught. Science is to be based on proofs, experiments, data, and if that data changes, then what is taught can be changed but not until then.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
168. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
169. This is probably the level where discussing incumbent theories should begin.
170. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
- 171.
172. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
173. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
174. See comments above.
175. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
176. Sufficient.
177. no comment
178. See previous comments
179. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
180. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
181. More rigor  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
182. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
183. teach science not religious dogma  
Remove key concepts.
184. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
185. Do not present evolution as a theory.
186. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
187. see above
188. Fourth grade science standards are adequate.
189. <https://www.nextgenscience.org/>
190. This is a new and different way of teaching science and teachers will need training, materials, and space.
191. Does not need any non scientific hypothesis such as creationism

192. See 19
193. Consider how to avoid having Diane Douglas ruin their work product. It was much better without her trying to promote her religion.
194. Teach only evolution. More hands on lessons.
195. Evolution should be taught, not creationism.
196. Seeing a learning progression of concepts would be very helpful to determine if these standards complement the other standards. The proposed key concepts column and connections to other disciplines should be rejected. As is stated on page 5 of the introduction, Standards are not curricular guides.
197. Teach that evolution is not a theory, but a fact.
198. Adopt NGSS!
199. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
200. See previous comments.
201. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
202. These standards are sufficient for the grade level
203. No religion in school, read the constitution!
204. The constitution
205. Take out the weather unit.
206. See my comments in no. 15
207. Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
208. Next Generation Science Standards
209. Not developmentally appropriate
210. Magnetic currents aren't a real thing and shouldn't be in the fourth grade standards.
211. keep evolution; reject intelligent design
212. include evolution as science
213. As Above
214. na
215. n/a
216. N/A

**Total Respondents 216**

**41.** What would you like the working group to consider as they revise the Physical Science Standards in the Fourth Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Where's the engineering and technology (coding)
3. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
4. Make it clear if this is more than electric circuits, as P4U2.1 could also be water, wind, or solar energy



being transferred as well.

page 25

5. Incorrect information: Table Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents. Must remove "and magnetic" After speaking to an APS training supervisor and requesting help to understand what magnetic currents are I was told there were no such thing.

6. no suggestions

7. Wait to Test.

8. Nothing in particular.

9. Nothing

Page 25

In the first and second paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for.

10. Remove Key Concept Column

Under 4.P4U2.2 - why did "and magnetic" get added by ADE? What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.

11. 4.P4U2.1 The transfer of energy standard is too vague. Are we supposed to teach the radiant energy spectrum, or electromagnetism, or both? Is there more to energy transfer that needs to be taught? We need the standards to be more specific, so we know exactly which aspects to teach.

12. n/c

13. Our team wanted to know how or what type of resources (books, newspapers, etc.) would be given to the grade level to meet these standards.

14. More information about what types of energy teachers should focus on should be included. Will they need to spend time on: Potential, chemical, nuclear, gravitational, mechanical, Kinetic, GRAVITATIONAL, CHEMICAL, NUCLEAR, ELASTIC, MOTION, THERMAL ENERGY AND TEMPERATURE. Without more focus, this could be the only focus for the entire year!

15. Simplification.

16. Please expand on the "construct an explanation and engage in argument from evidence" in 4.P4U4.3. eg. write an essay, etc.

17. The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.

18. A more clearer perimeters to teach within.

19. at this time there is nothing that I feel they need to consider, since they had pin pointed their expectations.

20. Funding

21. Adopt NGSS standards

22. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.

4.P4U2.2

23. the addition of magnetic has made this standard scientifically inaccurate, there is no such thing as magnetic currents

No such thing as magnetic currents.

24. Throughout the standards there is a clear misconception of what is energy, what is a fuel source, what is force, and what is power. These are all changes in green.

25. Evolution section is weak and watered down. It needs to be strengthened.

26. n/a

27. These statements are INCORRECT: Students develop an understanding of how Earth's resources can be transformed into different forms of energy. Students develop a better understanding of electricity and magnetism and how they are forms of energy. Earth's resources cannot be developed into energy; they can be transformed into fuels that provide

- energy.  
Electricity and magnetism are NOT forms of energy.
28. No comment
  29. n/a
  30. Do not attempt to deny or water down the concepts of evolution.
  31. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
  32. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
  33. Students should be taught how the energy for electricity is obtained. Magnetic currents don't exist.
  34. see above
  35. I couldn't care less about Fourth Grade.
  36. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
  37. 4.P4U2.2 There is no such thing as a magnetic current.  
4.P4U4.3 What are students supposed to be explaining? This standard does not make sense.
  38. Consistency in terminology - magnetic fields is the proper term, not currents.
  39. N/A  
The way in which the standards are written can cause misconceptions and confusions about energy as it is defined in science. There are different forms of energy including kinetic, potential, chemical potential, light, sound, heat, etc. In NGSS, energy standard reads, "Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents." This is not confusing.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
  40. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
  41. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
  42. Stick to actual science and stop dumbing down our children!
  43. Needs to go back to review.
  44. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
  45. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
  46. Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
  47. We should only be covering evolution in school. Creationism should be kept separate from schools.
  48. Send the standards back for review.
  49. Explain evolution.
  50. Include Evolution, omit Creationism and "Intelligent Design".

51. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
52. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
53. Refer reply in 20 above.
54. ....
55. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
56. Continue to teach evolution. Do not remove it to teach creationism.  
Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism.
57. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
58. Refer to my response to question 17.
59. Most kids will be too young to grasp the key concepts from 4.P4U2.2  
You seriously expect an 8 year old to truly understand what protons and electrons are?
60. Teach proper evolution
61. see above
62. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.  
Nothing should be taught within or alongside science that does not have the same factual basis that
63. all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
64. Ambivalent.
65. Evolution
66. All standards need to be included.
67. No comment.
68. see previous comments.
69. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
70. Adding and maintaining teaching Evolution needs to be continued.
71. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
72. Teach Science and facts in Schools not faith and religion.
73. N/A
74. No comment.
75. Fix evolution standards.
76. See comment #9
77. N/a
78. Only facts based on repeatable scientific tests.
79. No need. Go with the scientific evidence not creationism or religious indoctrination!!
80. Please do not muddy the language regarding evolution
81. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.

82. Teach Evolution
83. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
84. Revert all of Diane Douglas's changes.
85. evolution should be included in all grades
86. Ditto
87. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
88. Climate change, evolution, and big bang cosmology should be in these standards.  
There are several places in the draft standards where the term "model" seems to suggest a physical demonstration of a concept rather than a representation used to explain or predict. 4.P4U2.2 is one of those examples. I would rather see this standard state "Develop and use a model to explain and predict how energy is moved through electric." Also, rather than "magnetic currents" this standard should refer to "magnetic fields."
89. See above
90. Remove all religious references.  
4.P4U2.2  
Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents.
91. This is inaccurate, there are no magnetic currents.
92. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.  
"Develop and use a model that demonstrates how energy is moved from place to place through electric and magnetic currents."
93. Magnetic currents do not exist, please remove.
94. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
95. Get a scientific expert to rewrite the content or undo the edits.
96. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
97. Clearly include the teaching of the concept of evolution.
98. Original language should remain
99. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
100. No comment
101. That school is for teaching facts, not for promoting the views of any particular religious group.
102. See above.
103. See above
104. Get rid of "intelligent design." Restore references to evolution.
105. I don't teach 4th
106. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or

any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."

110. Don't revise.

111. Any change in curriculum de-emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self-copying DNA in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millennia is a scientific fact.

112. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.

113. Page 32, Table, Row labeled P4 – see comment 19 - #3.

114. Evolution is not just a theory, it is well-established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards, not an improvement.

115. A fourth grader's level of understanding of the Theory of Evolution.

116. Standard 2. magnetic currents is inaccurate

117. Teach our children science and not nonsense.

118. That is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.

119. The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.

120. See previous comments for earlier grades.

121. They can focus elsewhere with their improvements.

122. Please teach evolution and not creationism

123. SCIENTIFIC THEORY MUST BE TAUGHT

124. Teach evolution

125. This not the reason for my current comments.

126. Please do not make any changes or revisions to Fourth Grade 2018 Draft Physical Science Standards.

127. I am wondering if the physical unit for fourth grade includes discussion of different kinds of energy as in the past or do these standards exist in another grade level?

128. Keep evolution.

129. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.

130. No comment.

131. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.

132. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn. Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.

133. not enough detail

134. Science is evidence-based. Pseudoscience and faith-based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!

135. See comments above.

136. Eliminate the non-scientific, last-minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.

137. The introduction, appropriately, of birth control.
138. no comment
139. See previous comments
140. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
141. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
142. see above
143. teach science not religious dogma  
Remove key concepts.
144. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
145. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
146. see above
147. Fourth grade science standards are adequate.
148. <https://www.nextgenscience.org/>
149. Does not need any non scientific hypothesis such as creationism
150. See 19
151. More hands on.
152. Evolution should be taught, not creationism.
153. adding parts of the eye and parts of the ear are not helpful to understanding the concept in physical science.
154. Adopt NGSS!
155. See previous comments.
156. These are adequate
157. No religion in school
158. The constitution
159. Please change the verbase back to magnetic fields and NOT magnetic currents.  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
160. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
161. Not developmentally appropriate
162. 4.P4U2.2: Remove "and magnetic" from the standard to make it appropriate.
163. keep evolution; reject intelligent design
164. include evolution as science
165. As Above
166. na
167. N/A



**42.** What would you like the working group to consider as they revise the Earth and Space Science Standards in the Fourth Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
3. Make clearer connections between these standards.  
It makes total sense to move the study of rocks from 3rd to 4th grade. There are so many times that I have referenced the types of rocks in instruction about tectonics or erosion, and I get a lot of vague stares when I do, because students have forgotten that learning. Please keep that!
4. I like rocks being moved to 4th grade from 3rd. It ties nicely with tectonic plates, earth quakes, and volcanoes.
5. no suggestions
6. Wait to Test.
7. Nothing in particular.
8. Nothing
9. Nothing  
Page 26  
Remove Key Concept Column
10. Under UE1U1.6 - remove "volcanos" and Under 4.E1U3.10 remove "disasters, define the problem(s) and". What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
11. n/c
12. Our team likes this standard, it appears to be very familiar and has not changed much from the previous years.
13. This feels like it could be the entire focus for the year- lots of information to cover. Disasters feels like an afterthought; does it truly play an important role in the curriculum for 4th grade?
14. Simplification.
15. The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.
16. A more clearer perimeters to teach within.
17. at this time there is nothing that I feel they need to consider, since they had pin pointed their expectations.
18. Funding
19. Adopt NGSS standards
20. More focus with engineering and computer science in these areas.
21. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
22. none
23. Evolution section is weak and watered down. It needs to be strengthened.
24. n/a
25. Water cycle and weather unit have been removed. We follow Project Wet and do the city wide Water Festival. These activities and lessons are created to use with 4th graders.
26. No comment

27. n/a
28. re 4.L4U4.12. Did you know that there is no such thing as a Species in scientific terms (just as there is no scientific definition of species there is no scientific definition of race btw.). Bringing the word species in here is a large mistake. The word "Organisms" is a more appropriate term to use. The original wording was much better than what you have here now.
29. Do not attempt to deny or water down the concepts of evolution.
30. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
31. I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
32. this section is good
33. see above
34. I couldn't care less about Fourth Grade.
35. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
36. How are earthquakes and seismic waves being addressed without discussion of plate tectonics as well as convection?  
4.E1U1.5 This is WAY too broad.  
4.E1U2.7 This is part of 4.E1U2.6  
4.E1U4.9 This standard does not align with E1 "The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth's surface and its climate" The way it is written, it actually should be aligned with L2 "Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms."
37. 4.E1U3.10 The word "disaster" is not appropriate. We call an incident a disaster solely because of its impact on people. The same event, like a flood, could be a hazard without being a disaster.
38. N/A  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
39. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
40. Stick to actual science and stop dumbing down our children!
41. Needs to go back to review.
42. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
43. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
44. Evolution is not described nor incorporated accurately. This must be changed.
45. We should only be covering evolution in school. Creationism should be kept separate from schools.
46. It appears that the use of the word "whether" in 4.E1U2.6 is intentional to undermine evidence of fossil record. Possible Solutions: 4.E1U2.6 - delete the word "fossils". Limit this standard to tectonic evidence rather than fossil evidence since 4.E1U2.7 is about fossils. OR delete the word "whether"
47. It appears that the use of the word "whether" in 4.E1U2.6 is intentional to undermine evidence of fossil record. Possible Solutions: 4.E1U2.6 - delete the word "fossils". Limit this standard to tectonic evidence rather than fossil evidence since 4.E1U2.7 is about fossils. OR delete the word "whether"

and insert "how" and then delete the entire 4.E1U2.& standard because it then becomes redundant.

4.E1.U2.8 add the words "...and changes in patterns over time" or "...over various time scales."

48. Send the standards back for review.
49. Explain evolution.
50. Include Evolution (where relevant), omit Creationism and "Intelligent Design".
51. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
52. Reinstate evolution.
53. This seems not realistic for fourth grade: Plan and carry out an investigation to explore the interactions between Earth's major systems.  
Could this instead be: Plan and carry out an investigation to explore the interactions between human and natural systems.
54. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
55. Refer reply in 20 above.
56. ....
57. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
58. Continue to teach evolution. Do not remove it to teach creationism.
59. Evolution!
60. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
61. Refer to my response to question 17.
62. Some of these standards are a bit too similar to middle school standards. I might expect a kid to know that there is an atmosphere around our planet, but to know the individual layers at this age seems a bit much. Same with the concept of using evidence to show that plate tectonics is real; that's definitely a MS standard. A fourth grader should simply know that the Earth's surface is broken into large plates and that there is actually crust under the oceans.
63. Teach proper evolution
64. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
65. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
66. Ambivalent.
67. Evolution
68. All standards need to be included.
69. No comment.
70. see previous comments.
71. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
72. Adding and maintaining teaching Evolution needs to be continued.
73. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.

74. Teach Science and facts in Schools not faith and religion.
75. N/A
76. No comment.
77. Fix evolution standards.
78. See comment #9
79. The bullet point about 4th grade specifically on page 21. I feel the crossed out verbiage is preferable because it clearly indicated that there are cause and effect relationships between changes of resources and survival. Same thing goes for the crossed out verbiage on the top of page 25.
80. Only facts based on repeatable scientific tests.
81. Arizona is blessed with rich geologic formations that are exposed for easy study and exploration. The fourth grade earth and space standards need to focus more heavily on rocks and minerals as they relate to Arizona geology.
82. No need. Go with the scientific evidence not creationism or religious indoctrination!!
83. Please do not muddy the language regarding evolution
84. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
85. Teach Evolution
86. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
87. Revert all of Diane Douglas's changes.
88. evolution should be included in all grades
89. Seismic waves...if you're going to throw in earthquakes than please include TSUNAMIS. Do you know how many kids in Arizona High schools have told me their teacher said tsunamis are caused by gravitational forces of the moon????? Terrible. So if we could clean up this misconception early then the world would appreciate this.
90. Ditto
91. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
92. Climate change, evolution, and big bang cosmology should be in these standards.
93. 4.E1U2.4 - Seismic waves are the result of Earth movements; they transfer energy stored in rocks. What is not clear here is what you really want students to know about seismic waves. Do you want them to learn about how they are produced, they types of waves (S & P), how S&P waves impact human-engineered structures? The list of key concepts suggests that seismic waves affect mountain formation, where as it is mountain formation that produces seismic waves. A possible revision could be "Use models to explain seismic waves, how they are produced, and how they transfer energy." I also question whether the focus on seismic waves is appropriate for 4th grade; the concept seems more appropriate for high school. Instead, maybe the 4th grade standard should really be about fast and slow changes in the Earth's surface.  
  
4.E1U1.5 is too broad. What types of interactions are important here? This could encompass weather, climate, water supply, ecology, all of geology, etc. Be more specific here.  
  
4.E1U2.6 This standard should include not just evidence of past plate movements but also past environments. Furthermore, remove the word "whether" from this standard and replace it with "how."  
  
4.E1U2.7 seems similar to 4.E1U2.6 - could these two standards be combined?  
  
4.E1U4.9 This standard is too narrow. It should be about more than just the impact of water on life. It is really about the movement of water through connected systems. I suggest are revision that reads "Construct an evidence-based argument about how water moves through environmental systems and how these movements impact life systems."  
  
4.E1U4.9 - keep the word "hazards" and eliminate the word "disasters." Hazards can be problematic

but might not rise to the level of a disaster. For example, a rock fall might damage a highway but that is not a disaster on the scale of an earthquake or hurricane.

94. See above

95. Remove all religious references.

96. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.

97. "Identify the causes and effects of natural disasters, define the problem(s), and design solution(s) to minimize those effects on humans."

It is superfluous to add "define the problem" as that is included within the effects of natural disasters.

98. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.

99. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.

100. Get a scientific expert to rewrite the content or undo the edits.

The standards are heavy on Earth and Space and too light on Life Science. 4th grade students grasp biology concepts best. They struggle with concepts that are not as concrete, such as "geosphere, mesosphere....etc" The standard for 4.E1U2.6 is not developmentally appropriate for 9-10 year olds. I have been teaching 4th graders at a relatively middle class school for 15 years. The standards that students were able to learn best and keep their interest most engaged was our Ecosystems adaptations/Relationships unit. Atmospheric systems are too far removed for a 4th grader to

101. understand. They struggle to understand weather fronts and air pressure in our current standards.

Developmentally appropriate and age appropriate standards should be considered. Expecting students to master abstract concepts at 9-10 years old is unwise and uninformed about how children learn. Young students need to be able relate to their learning through observation and hands on activities. These standards need a thorough review with an eye towards developmental abilities to understand the concepts.

102. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.

103. Clearly include the teaching of the concept of evolution.

104. Original language should remain

105. Teach evolution. Evolution is science.

106. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!

107. No comment

108. That school is for teaching facts, not for promoting the views of any particular religious group.

109. See above.

110. See above

Those writing these standards should be experts in science and/or education.

At a minimum they should understand what the word "THEORY" means in scientific terms.

111.

Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"

112. Get rid of "intelligent design." Restore references to evolution.

113. I don't teach 4th

114. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or

any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."

115. Don't revise.

Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.

117. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.

118. Climate change needs to be included

119. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.

120. A fourth grader's level of understanding of the Theory of Evolution.

121. Standard 10: hazards is correct. Disasters only include extreme results of hazards and limits student understanding.

122. Teach our children science and not nonsense.

123. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.

124. The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.

125. See previous comments for earlier grades.

126. They can focus elsewhere with their improvements.

127. Please teach evolution and not creationism

128. SCIENTIFIC THEORY MUST BE TAUGHT

129. Teach evolution

130. This not the reason for my current comments.

131. Please do not make any changes or revisions to Fourth Grade 2018 Draft Earth and Space Science Standards.

132. This is a very content heavy unit. I like that it narrows so closely to earth science, but I don't think other units should also be heavy. the other content areas should stay on the lighter side to compensate for this unit.

133. Keep evolution.

134. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.

135. No comment.

136. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.

137. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.

138. not enough detail

139. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!

140. See comments above.



141. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
142. More about the possibility of life on other planets.
143. no comment
144. See previous comments
145. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
146. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
147. see above
148. teach science not religious dogma
149. Given the other material in this area and this age (specifically E1U3.10), this seems an appropriate time to introduce different naturally-occurring and man-made processes that affect the global climate.  
Remove key concepts.
150. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
151. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
152. see above
153. Fourth grade science standards are adequate.
154. <https://www.nextgenscience.org/>
155. Does not need any non scientific hypothesis such as creationism
156. See 19
157. Keep it based on scientific data only.
158. Evolution should be taught, not creationism.
159. Adopt NGSS!  
provide more guidance on: 1) Plan and carry out an investigation to explore the interactions between Earth's major systems.
160. 2) Develop and/or revise a model using various rock types and fossils to show evidence that Earth has changed over time
161. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
162. See previous comments.
163. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom!
164. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
165. These standards are adequate
166. Science only science
167. The constitution
168. Take out the huge weather unit.
169. Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.

170. Not developmentally appropriate
171. keep evolution; reject intelligent design
172. include evolution as science
173. As Above
174. na
175. N/A

**Total Respondents 175**

**43.** What would you like the working group to consider as they revise the Life Science Standards in the Fourth Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.  
Fourth grade should be the point where, in biology, the diversity and relatedness of life should be introduced. Evolutionary concepts should not be left to later grades. Starting early helps students understand these complex processes in the future.
2. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
3. Only adaptation and survival with a connection to the environment?
4. These two standards are very vague and broad. A little clarification and/or some specific examples would be helpful. Are we to teach about every species across the entire history of the Earth?
5. Specify "life"... all plants and animals on earth throughout history?  
The previous standard focused more on desert life which is easier to tackle.
6. no suggestions
7. Wait to Test.
8. Nothing in particular.
9. Nothing
10. Page 27
11. Remove Key Concept Column
12. n/c
13. Our team would like to know why this skill could not be taught by the "special area" teacher... (P.E.) which is similar to how middle school and high teachers work with the students.
14. align nicely with earth and space standards
15. Simplification.
16. The draft needs additional examples and explanation. It is left to interpretation. Please add resources where we can locate some of the new standards.
17. A more clearer perimeters to teach within.
18. at this time there is nothing that I feel they need to consider, since they had pin pointed their expectations.
19. Funding
20. Adopt NGSS standards
21. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
22. none
23. Evolution section is weak and watered down. It needs to be strengthened.

24. n/a
25. No comment
26. 4.L4U4.12 is the same exact standard as 1.L4U4.11.
27. I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.
28. n/a
29. Same comments as 2nd grade
30. Do not attempt to deny or water down the concepts of evolution.
31. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
32. this section is good
33. see above
34. I couldn't care less about Fourth Grade.
35. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
36. Without plate tectonics and historical evidence based on the scientifically documented eras how will determining causation for survival, extinction and adaptation be grounded in evidence and accurate?
37. TEACH EVOLUTION!
38. 4.L4U2.11 Environmental data will not provide this evidence. To look at evidence of change in species, students would need to look at geological and climate data.
39. Restore 4.L4U4.12 to original terminology.
40. Topics of adaptation, survival, and extinction are age-inappropriate and should be delayed until later grades.
41. If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
42. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
43. Stick to actual science and stop dumbing down our children!
44. Needs to go back to review.
45. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
46. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
47. 48.

49. See previous comments on the treatment of evolutionary biology.
50. Evolution is not described nor incorporated accurately. This must be changed.
51. We should only be covering evolution in school. Creationism should be kept separate from schools.
52. 4.L4.U4.12 is almost worded the same as 1.L4U4.11 -- Possible solution: Include the learning progression in the right column to add clarity about the standard and expectations/boundaries. For instance: on pg. 165 of A Framework "By end of grade 2" or "End of grade 5" can add clarity.
53. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
54. Don't eliminate references to evolution, as it's necessary to understand life sciences.
55. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
56. Evolution must be taught
57. Send the standards back for review.
58. Explain evolution.
59. Include Evolution, omit ANY MENTION OF Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
60. Reinstatement of evolution.
61. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
62. Refer reply in 20 above.
63. ....
64. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
65. Continue to teach evolution. Do not remove it to teach creationism.
66. include evolution  
Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism.
67. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
68. Refer to my response to question 17.
69. Darwin, please.  
L4  
Generally the life science standards seem less ties to the overall topics of the year and less ambitious, for third and fourth grade.  
In particular, with the focus in fourth grade on systems, it would be natural to talk more about ecological systems, food webs, connecting life cycles or food webs with cycles of water and energy on ecosystem scales, or talking about how food webs create interdependent communities, or how resources cycling also implies that one change in a resource or organism can impact many others. None of this seems to be mentioned anywhere in standards up to fourth grade despite such a focus on food chains and cycles for water and energy in standards
70. See #43 above
71. Introduced the word evolution as described by Charles Darwin at this level.
72. Strengthen the teaching of evolution and global change to reflect the science of these subjects.
73. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.

76. Teach proper evolution
77. As part of understanding the difference in opinion and fact it should be clear that evolution is a fact.
78. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.  
Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
79. Teach evolution as the scientific concept that it is and provide the data that supports the FACT that evolution drives diversity.
80. Micro-evolution.
81. L4
82. Evolution
83. All standards need to be included.
84. Evolution needs to be added back in as fact.
85. see previous comments.
86. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
87. Adding and maintaining teaching Evolution needs to be continued.
88. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
89. Teach Science and facts in Schools not faith and religion.
90. N/A
91. No comment.
92. Fix evolution standards.
93. See comment #9
94. See first comment
95. N/a
96. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
97. Only facts based on repeatable scientific tests.
98. Continue to use "evolution" and not "theory of evolution"
99. The unity and diversity of organisms, living and extinct, is the result of evolution.
100. No need. Go with the scientific evidence not creationism or religious indoctrination!!
101. Please do not muddy the language regarding evolution  
Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.
102. Please don't avoid education on evolution.
103. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
104. Teach Evolution
105. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
106. Revert all of Diane Douglas's changes.
- 107.

108. evolution should be included in all grades
109. They need to start learning about where they and everything came from, via evolution
110. Ditto
111. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
112. Climate change, evolution, and big bang cosmology should be in these standards.
- 4.L4U2.11 - this standard should include causes. "Analyze and interpret environmental data that
113. demonstrates how species adapt and survive or go extinct over time in response to environmental changes."
114. See above
115. Remove all religious references.
116. Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.
117. Evolution should not be omitted from this curricula.
118. Ditto
119. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
120. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
121. L4: The diversity of organisms, living and extinct, is the result of evolution was changed to The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.
122. The original statement is clearer and should be retained.
123. Get a scientific expert to rewrite the content or undo the edits.  
More standards for Life Science such as a specific standard for plant and animal adaptations so that students can better understand 4.L4U2.11. 9-10 year olds need more work on plant and animal
124. adaptations RIGHT BEFORE they attempt to understand extinction, survival and mutations. Learning about this in previous years will not necessarily prepare students for higher level concepts. It should be retaught in 4th grade if it is introduced in prior grades.  
The Internal Review provided excellent additional development and clarification. Especially important is how the Internal Review draft provides approaches that involve asking questions and understanding how arguments based upon evidence do aid the learning process. The Internal Review draft should be adopted.
125. What follows is repeated for grades 3-5 and is based on the "Distribution..." Table:  
" L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms."  
This is imprecise. In each section this should read "The study of evolution seeks to demonstrate..."  
First, evolution is an established scientific theory.  
A scientific theory differs from the "street" use of theory, which indicates a "guess" about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.
126. Two things distinguish evolution as a "scientific theory" from the more general use of "theory." First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven.  
Thus it is the STUDY of evolution – mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to "test" the underlying theory) – that have provided evidence of "the unity and diversity of living and extinct organisms."



127. Clearly include the teaching of the concept of evolution.
128. Original language should remain
129. Teach evolution. Evolution is science.
130. We need to start teaching children about all aspects of life including evolution from the very beginning.
131. Continuing with Evolution and leaving in biological evolution and natural selection.
132. No comment
133. That school is for teaching facts, not for promoting the views of any particular religious group.
134. Environmental studies should include information regarding human impact.
135. See above  
Those writing these standards should be experts in science and/or education.  
  
At a minimum they should understand what the word "THEORY" means in scientific terms.
136.  
  
Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
137. Get rid of "intelligent design." Restore references to evolution.
138. I don't teach 4th  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or
139. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
140. Don't revise.  
Any change in curriculum de-emphasizing the truth that evolution is a scientific fact, evidenced by the
141. replication of self-copying DNA in science labs and modern genetic engineering efforts is wrong.  
Period. Evolution through natural selection over millennia is a scientific fact.
142. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
143. The inclusion of evolution must be reinstated.
144. Page 32, Table, Row labeled L4 – see comment 19 - #4.
145. Evolution needs to be taught
146. Evolution is not just a theory, it is well-established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
147. A fourth grader's level of understanding of the Theory of Evolution.
148. Teach our children science and not nonsense.
149. That intelligent Design is just one of several approaches to Life Science, and not the exclusive nor irrefutable means to explain development of any forms of life.
150. That is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually
151. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
152. See previous comments for earlier grades.
153. Global warming caused by should be directly mentioned in any discussion of extinctions. Climate has a massive impact on extinctions as species fail to adapt quickly enough.
154. They can focus elsewhere with their improvements.

155. Please teach evolution and not creationism
156. SCIENTIFIC THEORY MUST BE TAUGHT
157. Teach evolution
158. As above
159. More coverage of the E-word here, please.
160. This not the reason for my current comments.
161. Please do not make any changes or revisions to Fourth Grade 2018 Draft Life Science Standards.
162. I feel that most of life science can be in earlier grades and 5th as you have it in the draft. Please keep these standards connected to what they are learning in the other units.
163. No creationism.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
164. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
165. This is probably the level where rigor in using the term "evolution" becomes important.
166. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
167. It's raking away our liberty.
168. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
169. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
170. See comments above.
171. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
172. Sufficient.
173. no comment
174. See previous comments  
Referring to evolution as only a "theory" when the vast majority of all biological standards we know
175. and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined.
176. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
177. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
178. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
179. see above
180. teach science not religious dogma
181. Introducing causes of climate change leads nicely into L4U4.12. Students should explore how changing regional and global climates affect the extinction of species.

In L4U4.11, make the introduction and exploration of evolution be an explicit inclusion as it is in the Distribution of Grades 3-5 Standards table later on.

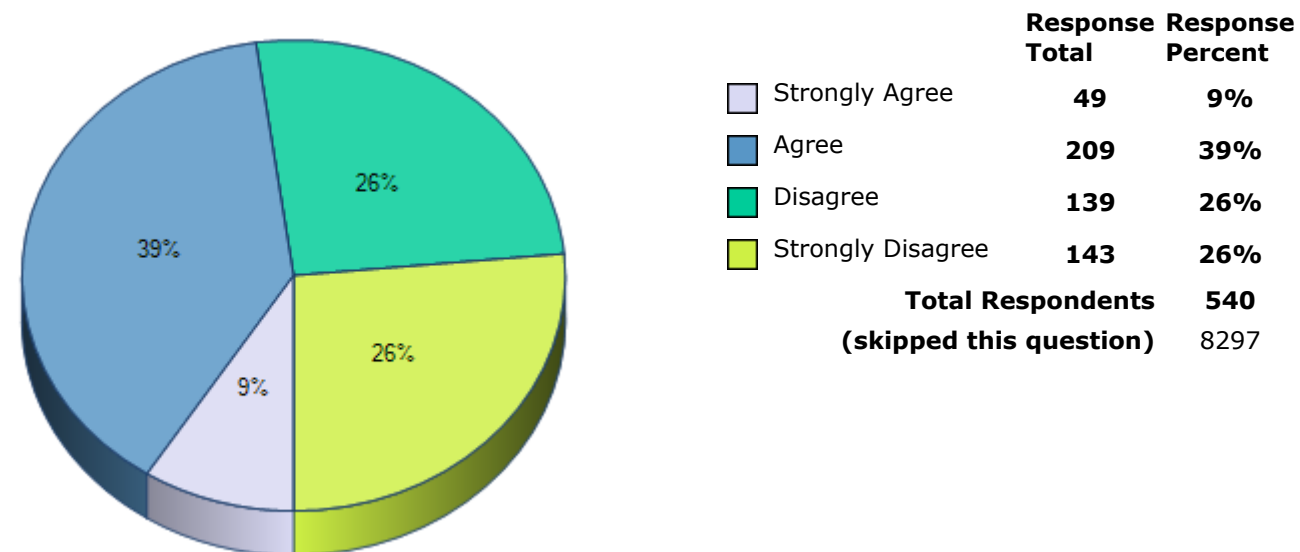
Remove key concepts.

182. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
183. Do not present evolution as a theory.
184. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
185. Delete the words "theory of" in the Life Science section L4.
186. see above
187. Fourth grade science standards are adequate.
188. Drop the theory of evolution.
189. <https://www.nextgenscience.org/>
190. Does not need any non scientific hypothesis such as creationism
191. See 19
192. Evolutionary data only at this point.
193. Evolution should be taught, not creationism.
194. Teach that evolution is not a theory, but a fact.
195. Adopt NGSS!
196. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!  
To complement standard 4.L4U2.11 "Analyze and interpret environmental data that demonstrate that
197. species either adapt and survive or go extinct over time.", the term "natural selection" should be added to key concepts, since that is the concept being described in this standard.
198. The study of fossil records and extinction are very important
199. No religion in school
200. The constitution
201. See my comments in no. 15  
To whom it may concern,  
  
As an infectious disease doctor, my patients' lives and limbs depend on my science knowledge. Protecting our country from biological warfare attacks, disease outbreaks, foodborne illness, diseases affecting our crops and natural disasters will be difficult or impossible without a science-educated workforce.  
I feel that it is very important for our students to learn basic science, including facts about evolution, gene technology, global warming and vaccines without interference from religious extremists or
202. science deniers.  
Watering down science curriculum with religious nonsense does a disservice to our society, making our country less competitive with more reasonable nations, and less safe.  
  
Sincerely,  
  
Steven Oscherwitz MD  
Infectious Disease  
Tucson, Arizona  
  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
203. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
204. Not developmentally appropriate

- 205. keep evolution; reject intelligent design
- 206. include evolution as science
- 207. As Above
- 208. na
- 209. N/A

**Total Respondents 209**

**44.** The Fifth Grade Science Standards are appropriate for this grade level and complement the other Grades 3-5 Science Standards.



**45.** What would you like the working group to consider as they revise the Fifth Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. INputting standards for engineering and technology - not just relationships. There are national standards for engineering and yet we ignore them. Our students get further behind because we have to do robotics in grade 3-5 afterschool.
3. Write out the examples of topics instead of referring you to the previous grade(s).
4. I like how the old standards were separated by content (ie chemistry, physics, etc) instead of just by science type. It's hard to distinguish at first glance how to separate them and they are hard to read.
5. The curriculum and resources available
6. Third grade often omits science from its curriculum. It is concerning as to how students will be prepared for fifth grade standards when they might not have gotten it in the lower grades.
7. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.  
There are an alarmingly high amount of discrepancies between the learning progressions. For example, 4.P4U4.3 discusses flow of energy from place to place. It also goes on to connect to standard 1.P3U1.3 which refers to pushing and pulling forces. While there are clear similarities, the depth of those similarities are FAR beyond what 4th graders would be capable of comprehending without more specific content knowledge. Additionally, in 5th grade, standard 5.P2U1.3 refers to constructing an explanation explaining forces (which connects to the first grade standard, but not electrical currents etc. in the 4th grade) and lists chemical bonds as a concept.. Unless 5th graders are learning college level chemistry and intermolecular forces. There is a HUGE disconnect between the wording of the standards and their connections due to some being macro concepts and some being micro concepts.
- 8.

9. The life science standard which addresses reproduction and includes humans is not developmentally appropriate for 5th graders. They are not mature enough to have lessons and conversations about this topic. It should be moved to a different grade level, such as junior high.
  1. The lack of detail could lead to districts teaching material differently or in different levels of depth. This could inadvertently lead to districts focusing on one topic of a standard and another district quickly skimming by it. This could lead to holes in the knowledge of students if students move from one district to another.
  2. Studying scientific endeavors or current science investigations/discoveries would be beneficial to contribute to global minded thinkers. Students should know what's happening in the world around them.
  3. Keep the Key Concepts! This will help with consistency across the state.
10. The standard 5.L3U1.9 is unclear about to what extent the concepts will be covered. Reproduction is not an age appropriate concept for fifth graders, yet the standard includes humans.
11. no suggestions
12. Wait to Test.
13. Nothing in particular.
14. Nothing
15. I think it is great to start them out early with supporting their reasoning. Our purpose is for students to think. The internet has made everyone lazy so the crosscutting concept of problem solving should be in every grade level.

Page 9, 21, 33  
Remove last sentence: "Suggestions for key concepts...or maximum content limits."

Pages 12, 15, 19, 24, 28, 31, 37, 41, 45  
Remove these connections - as soon as standards change the Science standards need to be changed. Each group of standards needs to be stand alone. If ADE wants to have another document that does a crosswalk of all of the standards in another document, that would be more appropriate than the Science Standards.

Page 21  
Remove additions by ADE: "and between content areas" and descriptions under third grade and fourth grade. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
16. n/c
17. with the number of physical science standards, it seems like this is the main focus for 5th grade.
18. I'd like us to implement the Next Generation Science Standards, already in use in many states and districts. <https://www.nextgenscience.org/>
19. The Key concepts should be dropped from every grade level.
20. Simplification.
21. i fell like human development should not be allowed for this grade level
22. Look at the content and make sure it is age and grade appropriate.
23. They need to have age appropriate content and topics.
24. A more clearer perimeters to teach within.
25. I think that they are not ready to learn about reproduction
26. I do not think that Human Reproduction and Life cycle is age appropriate for fifth grade. I also believe that this content should be reserved for each family to teach.
27. Funding
28. I trust the work of Science Specialists who devoted their time and energy to improve Arizona's science standards and request their direct incorporation as new standards.
29. Adopt NGSS standards
30. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
- 31.
- 32.

33. Return to original wording
34. Evolution section is weak and watered down. It needs to be strengthened.
35. n/a
36. No comment
37. the word "forces" is used a lot in these 5th grade standards. the correct term should be "force" - gravitational force, magnetic force, etc.
38. All the standards should be aligned with each grade level and grow in rigor as the student moves through the higher grade levels. The content, though, should be similar in all grade levels.
39. Do not attempt to deny or water down the concepts of evolution.
40. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
41. "In a closed system" should not be substituted for the words "Universe"
42. too few standards
43. see above
44. I couldn't care less about Fifth Grade.
45. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
46. Include health standard that includes body awareness and human sexual education
47. Same as previous comments
48. TEACH EVOLUTION!  
In fifth grade, students apply their understanding of scale at micro levels as they investigate changes in matter and at macro levels as they investigate patterns in space systems and environments. - In the internal review, "space systems and environments" is crossed out. This statement does not make sense when it is crossed out.
49. Restore 5.P1U1.1 to original language.
50. Get rid of the "knowing and using science" and key concepts. Integrate more the three dimensions of "A Framework for K-12 Science Education."
51. evolution rather than "theory of"  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
52. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
53. Stick to actual science and stop dumbing down our children!
54. Needs to go back to review.
55. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.  
Fifth graders are not ready for Reproduction standards. The earth science and matter standards pre-K their interest and they love it! The skeletal and muscular system is far more appropriate, Fifth graders are not mature enough for these standards and it will lead to further investigations that they aren't ready to hear in school!
56. Please revise.
57. Please revise.
58. Please revise.
59. Please revise.



60. Genetic is not something 5th graders can understand at their age
61. Evolution is not described nor incorporated accurately. This must be changed.
62. Stronger emphasis on the scientific method. See my comments above for Grade Four.
63. We should only be covering evolution in school. Creationism should be kept separate from schools.
64. Include all of the crosscutting concepts (CCC) that could be aligned with the standard(s) in the actual table. The introduction gives guidance of the CCC's for kindergarten, however they need to be integrated into the standards or they will not be taught as deemed in the introduction (3-dimensional instruction)
65. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
66. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
67. Send the standards back for review.
68. Explain evolution.
69. Include Evolution, omit Creationism and "Intelligent Design".

Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
70. Reinstatement of evolution.
71. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
72. Refer reply in 20 above.
73. ....
74. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
75. Continue to teach evolution. Do not remove it to teach creationism.

Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism.
76. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
77. Refer to my response to question 17.

Evolution is an accepted theory of science. The striking of this word and replacing it with more generic terminology is misleading and weakens the standards. The redefining of evolution as "seeks to make clear the unity and diversity of living and extinct organisms" is meaningless and not in alignment with accepted scientific thinking. The term and definition of evolution should remain as is.

The reason for renaming of the scientific method to "science and engineering" is dubious and is not in alignment with accepted scientific thinking. The scientific method is a process by which facts demonstrate proof to validate or disqualify any scientific theory. The term scientific method should remain as is.

The elimination of the scientific theory of the origin of the universe, known as the Big Bang is also dubious and not in alignment with accepted scientific thinking. References to the Big Bang should remain as is.

The changes outlined above weaken the Arizona K-12 science standards and moves us away from creating a system that provided world-class education. I oppose these changes.
78. Darwin, please.
79. Abstract concepts such as density and atomic structure may be challenging for fifth grade students.
80. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
- 81.
- 82.

83. Teach proper evolution
84. Evolution must continue to be taught
85. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
86. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
87. Seems too early to introduce the periodic table
88. In the introductory paragraph (pg 29) keep "genetic information passed from parent to offspring". Does the Dept. of Education know something that the rest of the scientific community does not? Also in P1U1, remove the word "atom" from the text. We also cannot see electrons, proton, neutrons, etc.
89. Students need to be introduced to basic scientific literature.
90. L4
91. Evolution
92. All standards need to be included.
93. No comment.
94. see previous comments.
95. All of the grade level standards are less clear in this draft than they were in the 2004 version. Is there some way to organize updated scientific structure so it's not so clunky and redundant?
96. Add social sciences and sustainability
97. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
98. This seems to be the grade level when evolution is introduced, which seems a bit late in my opinion. Be that as it may, IT IS NOT A THEORY. Do NOT call it such, it is a fact.
99. Adding and maintaining teaching Evolution needs to be continued.
100. I would like to see more of the engineering design process and computational thinking to be included in these standards and all the science standards. The earlier we get students to start thinking this way the better off they will be. We need to be preparing our students for a future of technology!
101. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
102. Teach Science and facts in Schools not faith and religion.
103. Students need MORE SCIENCE in every level!
104. N/A
105. Sure up wording around evolution topic
106. Fix evolution standards.
107. See comment #9
108. Seems appropriate. No issues.
109. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
110. More critical thinking.
111. No need. Go with the scientific evidence not creationism or religious indoctrination!!
112. Please do not muddy the language regarding evolution
113. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
114. Teach Evolution

115. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
116. Revert all of Diane Douglas's changes.
117. evolution should be included in all grades  
I really wish that they hadn't changed so much. For example. As a 5th grade science teacher, almost all of my Earth and Space science standards are now in the 6th grade standards per the draft. That
118. leaves an entire quarter's worth of curriculum which now has to be changed and readjusted without any textbooks. Why did they move and change so much of the previous standards' content to different grade levels? I don't understand their reasoning.
119. Bring back the word "evolution."
120. Climate change, evolution, and big bang cosmology should be in these standards.
121. See comments from previous on 5.L4U4.11
122. See above
123. Remove all religious references.
124. Consider the claim that advances in science and technology produce products. There should be more emphasis on science and tech being used to understand complex processes and the natural world. Sustainability in development and growth should be taught.
125. The key concepts go off on tangents not related to the standard or put an unnecessary focus on irrelevant aspects of the standard.
126. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
127. The addition of the Key Concepts column add vocabulary words that would normally be the decision of local districts. This column is unnecessary and superfluous.
128. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
129. Get a scientific expert to rewrite the content or undo the edits.
130. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
131. Clearly include the teaching of the concept of evolution.
132. Original language should remain
133. By 5th grade the observations related to climate change should certainly be introduced. I'm not going to give explicit examples: there are many sources of such material
134. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
135. 3
136. No comment
137. That school is for teaching facts, not for promoting the views of any particular religious group.
138. See above
139. Get rid of "intelligent design." Restore references to evolution.
140. I don't teach 5th, never have. We don't have time to meet with these other grades and figure out what needs to be done.
141. Not utilize language in re Darwinism, natural selection or evolution.
142. Not utilize language in re Darwinism, natural selection or evolution.
143. Not utilize language in re Darwinism, natural selection or evolution.

- Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or
144. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
145. Don't revise.
- Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the
146. replication of self copying dna in science labs and modern genetic engineering efforts is wrong. Period. Evolution through natural selection over millenia is a scientific fact.
- Scientific standards should be based on scientific research and nothing else. Replacing and watering
147. down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
11. Page 29, 1st paragraph, 2nd sentence – Suggest not deleting "that genetic information can be
148. passed down from parent to offspring." This fundamental life science concept should be introduced to grade school level students.
149. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
150. A fifth grader's level of understanding of the Theory of Evolution.
- This would be an agree without the ADE changes. Look at number of standards and grain size in this grade band compared to other grade bands.
- Connections to other academic disciplines.
- Remove entirely from the document. This belongs in a support document or curriculum adopted locally.
  - These do not belong in a standards document. They become obsolete as soon as any of the standards from referenced disciplines are updated and approved by the state board.
  - Additionally, many of the connections cited don't actually align to the standards within the grade level.
- Key concepts Column
- What ADE added are not actually concepts, they are random vocabulary terms which may or may not be aligned to the standards and in many cases are not appropriate for the grade level.
  - Remove they key concepts column from the document.
  - If ADE requires that the key concepts column remains, select the actual concepts from the Framework or Big Ideas documents, since those documents are research-based and used in the development of the standards.
151. • Key concepts, if included must represent concepts from all three dimensions, and not just the content of science.
- Below is an example for 5.P1U1.2 Follow this process for each of the fifth grade standards, not just the example below.
- Remove list of vocabulary terms from the Key Concepts column and replace with the actual concepts related to this standard that represent all three dimensions:
- Measure and graph quantities such as weight to address scientific and engineering questions and problems.
  - The amount of matter is conserved when it changes form, even in transitions in which it seems to vanish.
  - No matter what reaction or change in properties occurs, the total mass/weight of the substances does not change.
  - Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.
  - Science assumes consistent patterns in natural systems.
152. Teach our children science and not nonsense.
153. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
154. They should consider not allowing Diane Douglas any say in revising the standards and revise them only to reflect scientific discoveries, not religious beliefs and pressure from right-wing political groups.
155. See previous comments for earlier grades.

156. They can focus elsewhere with their improvements.
157. Please teach evolution and not creationism
158. SCIENTIFIC THEORY MUST BE TAUGHT
159. Science, not creationism.
160. Teach evolution
161. The amount of time expected— 45 min per day is not realistic
162. This not the reason for my current comments.
163. Please do not make any changes or revisions to Fifth Grade 2018 Draft Science Standards.
164. Keep evolution. No creationism.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
165. Discussion of incumbent theories and how they are refined or replaced should be included.
166. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
167. not enough detail  
Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
168. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
169. See comments above.
170. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
171. More about sexuality and, appropriately, birth control.
172. no comment
173. See previous comments
174. The periodic table is too difficult to teach to that age group.
175. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.  
I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
176. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
177. See foregoing comments  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
178. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
179. see above
180. teach science not religious dogma  
Remove key concepts.
181. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
- 182.
- 183.

184. Do not present evolution as a theory.
185. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
186. see above
187. Fifth grade science standards are adequate.
188. <https://www.nextgenscience.org/>
189. This is a new and different way of teaching science and teachers will need training, materials, and space.
190. Does not need any non scientific hypothesis such as creationism
191. See 19
192. More hands on learning. Evolutionary process
193. Evolution should be taught, not creationism.
194. Seeing a learning progression of concepts would be very helpful to determine if these standards complement the other standards. The proposed key concepts column and connections to other disciplines should be rejected. As is stated on page 5 of the introduction, Standards are not curricular guides.
195. Teach that evolution is not a theory, but a fact.
196. Adopt NGSS!  
MAny schools are including 5th grade into the middle school chunk. These standards need more NGSS language if we are going to be adopting anything near NGSS in the future. If we are not, why do we
197. allow the districts to use NGSS then 4 and 8 fail AIMS? We are not giving our students the foundational skills from one grade to the next. We are allowing them to fail. Look at Riverside #2. Teaching NGSS but testing AIMS Science. Scores are awful.
198. Keep what we have. No problem.
199. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
200. See previous comments.
201. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
202. These standards seem adequate
203. No religion in school
204. The constitution
205. See my comments in no. 15  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
206. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
207. Next Generation Science Standards
208. Not developmentally appropriate
209. keep evolution; reject intelligent design
210. include evolution as one valid scientific approach
211. As Above
212. na
213. n/a
214. N/A



**46.** What would you like the working group to consider as they revise the Physical Science Standards in the Fifth Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Where us STEM (Science, Technology, Engineering and Math)
3. Separate them. Make them more specific.
4. The curriculum and resources available
5. Assuming that students already have electricity and magnetism when there is no guarantee that third grade will even teach it. At our school, primary levels rarely teach science content.
6. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
7. There should be a balance between the 3 sections of science but physical science has 6 standards, earth only has 2 and life has 3.
8. So many Physical Science Standards! In the 4th Grade there's so many Earth & Space Standards. Perhaps balance the material out better so each grade level isn't as heavy in one type of science.
9. Consider that the current draft is very heavy in physical sciences for fifth grade.
10. no suggestions
11. Wait to Test.
12. Nothing in particular.
13. Nothing  
Page 29  
In the first paragraph, remove the additions by ADE and restore it to what the teachers had there. Unless it was a grammatical fix, it should be returned to what the teachers asked for.
14. Remove Key Concept Column  
  
Under 5.P1U1.1 remove "(atom)" and "in a closed system" and under 5.P3U3.5 remove "and design solutions". What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
15. n/c
16. the standards specifically state a closed system. Is any focus supposed to be paid to open systems?
17. Simplification.  
  
I really like #1- 5th grade is now really heavy on physical science standards. I am not trained on these specific science skills for all of these contents. There are concerns about adding this on if I don't understand it concepts myself.
18. Teachers in 5th grade are not trained for this particular area in standards.
19. This seems to be a very heavy topic you added to the standards. There is concern that teachers are not trained enough to teach this to kids.
20. A more clearer perimeters to teach within.
21. Funding
22. Adopt NGSS standards
23. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
24. 5.P1U1.1  
"in a closed system" should be removed....  
the amount of matter stays the same, some may leave the system but but leaving does not change

- the fact that you end with the same amount of matter that you started with when there is a chemical reaction
26. 5.P1U1.1  
take out atom- this is 5th grade and particle is perfect. take out closed system- not necessary.
27. Evolution section is weak and watered down. It needs to be strengthened.
28. n/a
29. No comment
30. Do not attempt to deny or water down the concepts of evolution.
31. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
32. this section is good
33. see above
34. I couldn't care less about Fifth Grade.
35. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
36. TEACH EVOLUTION!
37. Restore 5.P1U1.1 to original language.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
38. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
39. Stick to actual science and stop dumbing down our children!
40. Needs to go back to review.
41. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
42. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if students are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science courses such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
43. We should only be covering evolution in school. Creationism should be kept separate from schools.
44. Delete the word "atom" in 5.P1U1.1 -- evidence for deleting this term can be found on pg 108 of the Framework, "Boundary: at this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism..." Key terms are not accurate for 5th grade level (nice to know, but not have to know)
45. Key Terms are not necessary (appropriate) based upon the Framework pg. 108 -- please delete terms
46. Send the standards back for review.
47. Explain evolution.
48. Include Evolution, omit Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earth's problems.
49. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism
- 50.

and "Intelligent Design" into the state science standards.

51. Refer reply in 20 above.
52. ....
53. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
54. Continue to teach evolution. Do not remove it to teach creationism.
55. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
56. Refer to my response to question 17.
57. This is going to be very challenging for fifth grade students. Teachers need scaffolding and ample support. These concepts (atomic structure or solutions/suspensions) are going to be tough. Teachers also need to make sure there is TIME in their day to teach Science as it is frequently pushed to the wayside in elementary settings.
58. Teach proper evolution
59. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
60. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
61. Ambivalent.
62. Evolution
63. All standards need to be included.
64. No comment.
65. see previous comments.
66. See items 38 and 41 above.
67. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
68. Adding and maintaining teaching Evolution needs to be continued.
69. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
70. Teach Science and facts in Schools not faith and religion.
71. N/A
72. No comment.
73. Fix evolution standards.
74. See comment #9
75. N/a
76. Only facts based on repeatable scientific tests.
77. No need. Go with the scientific evidence not creationism or religious indoctrination!!
78. Please do not muddy the language regarding evolution
79. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
80. Teach Evolution
81. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.

82. Revert all of Diane Douglas's changes.
83. evolution should be included in all grades
84. There is SO MUCH information to be covered in Physical Science for 5th grade and very little in the other science subjects. I wish this was better balanced.
85. Ditto.
86. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
87. Climate change, evolution, and big bang cosmology should be in these standards.
88. 5.P3U3.6- Energy is always present. This standard should read "Analyze and interpret data to determine how and where energy is transferred when objects move."
89. See above
90. Remove all religious references.  
5.P1U1.1 says Analyze and interpret data to explain that matter of any type can be subdivided into particles too small to see (atom) and in a closed system, if properties change or reactions occur, the amount of matter stays the same. This standard combines two big ideas (particulate nature of matter and conservation of matter); they should be two different standards. Furthermore, , 6.P1U1.3 states Develop and use models to demonstrate that matter is made up of smaller particles called atoms. It seems that 6.P1U1.3 should be before 5.P1U1.1 and that 5.P1U1.1 should be in 6th grade and just address conservation of matter.
91. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
92. I would put in more physical science since children can intuitively understand Newton's laws at this age.  
"Analyze and interpret data to explain that matter of any type can be subdivided into particles too small to see (atom) and, in a closed system, if properties change or reactions occur, the amount of matter stays the same."
93. The addition of the word "atom" assumes that it is scientifically impossible to see an atom, which is not true.
94. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do jot do this.
95. Get a scientific expert to rewrite the content or undo the edits.
96. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
97. Clearly include the teaching of the concept of evolution.
98. Original language should remain
99. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
100. No comment
101. That school is for teaching facts, not for promoting the views of any particular religious group.
102. See above
103. Those writing these standards should be experts in science and/or education.  
At a minimum they should understand what the word "THEORY" means in scientific terms.

Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"

107. Get rid of "intelligent design." Restore references to evolution.
108. I have never taught 5th grade
109. Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
110. Don't revise.
111. Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
112. Page 32, Table, Row labeled P4 – see comment 19 - #3.
113. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
114. A fifth grader's level of understanding of the Theory of Evolution.
115. Standard 1: Atom is a word students at this grade level can memorize, not understand. The addition of closed system doesn't make sense as inserted. The amount of matter stays the same whether you are in a closed system or not - it just doesn't all stay within the system. Huge difference. Please do not create student misconceptions.
116. Teach our children science and not nonsense.
117. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.
118. The new standards are unconstitutionally requiring creationism and minimizing and altering factually based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
119. See previous comments for earlier grades.
120. They can focus elsewhere with their improvements.
121. Please teach evolution and not creationism
122. SCIENTIFIC THEORY MUST BE TAUGHT
123. Teach evolution
124. This not the reason for my current comments.
125. Please do not make any changes or revisions to Fifth Grade 2018 Draft Physical Science Standards.
126. Keep evolution. Do not add creationism.
127. I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
128. No comment.
129. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
130. Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
131. not enough detail
132. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your

- religious beliefs! Shame on you!
133. See comments above.
134. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
135. As in item 48 above.
136. no comment
137. See previous comments
- I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
138. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
- It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
139. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
140. teach science not religious dogma
- Remove key concepts.
141. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
142. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
143. see above
144. Fifth grade science standards are adequate.
145. <https://www.nextgenscience.org/>
146. Does not need any non scientific hypothesis such as creationism
147. See 19
148. Don't over complicate things.
149. Evolution should be taught, not creationism.
150. Adopt NGSS!
151. See previous comments.
152. This is fine
153. Read and hold true to the constitution no religion
154. The constitution
- Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
155. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
156. Not developmentally appropriate
157. keep evolution; reject intelligent design
158. include evolution as one valid scientific approach
159. As Above
160. na
161. N/A
162. Big Bang. Red shift. Cosmic Background Radiation. H/He relative abundance.



## Total Respondents

**47.** What would you like the working group to consider as they revise the Earth and Space Science Standards in the Fifth Grade Science Standards?

1. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
2. Where is STEM - the engineering part
3. Needs more depth. Make standards more clear as patterns in space can cover a lot of information
4. The curriculum and resources available
5. These standards seem to make a bit more sense.
6. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
7. Additional Earth and Space standards should be added and Physical standards should be removed in order to create a balance for each discipline.
8. These standards are nicely written, developmentally appropriate and students find these topics interesting in 5th Grade!
9. It seems that the idea of gravity is repetitive when including it in physical science as well as Earth and Space
10. no suggestions
11. Wait to Test.
12. Nothing in particular.
13. Nothing  
Remove Key Concept Columns
14. Under the paragraph on Earth and Space Sciences, remove "position", under 5.E2U2.8 remove "(towards the center of the spherical Earth)", and under 5.L3U1.9 remove "can" and "the" that were all added by ADE. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.
15. n/c  
5.E2U2.8 ignores the fact that other celestial bodies have a gravitational pull as well. Do we focus on the gravitational pull of the sun in keeping the planets in orbit? What about the moon and tides in relation to earth's gravity? I would recommend moving several of the 6th grade standards to 5th grade so teachers can go deep into these concepts rather than floating along the surface. Depth is better than breadth!
16. Simplification.
17. The space topics have been limited. They don't teach as much as they used it. The students used to get to spend a lot of time with space and kids at this age are so fascinated with space and love it.
18. I don't think that there is enough being taught in the new space standards. I think that space is a fascinating subject and it really gets the student to engage.
19. Bring back the space you removed.
20. A more clearer perimeters to teach within.
21. Funding  
to link to the physical science standards about matter, once again consider a standard that addresses the atoms (elements) that make up the minerals that then make up rocks that are the crust of the earth.
22. Adopt NGSS standards
23. More focus with engineering and computer science in these areas.
24. We should go back to the standards that the committee created and adopt those, not Diane Douglas's

internal review copy.

5.E2U2.8

27. Why add towards the center of the spherical Earth, are we really allowing the individuals that believe the earth is flat to influence our state standards?
28. 5E2U2.8 Must we feed into the flat Earth people?
29. Evolution section is weak and watered down. It needs to be strengthened.
30. n/a
31. No comment
32. page 30 - 5.E2U2.8 - Gravity is NOT directed down to the Earth. Gravitational pull pulls to the center, and if strong enough out of the other way (Black Hole). OnEarth, Gravity feels like it is directed down, but it is not "down". the word is misleading and teaching inaccurate concept of gravity.
33. Do not attempt to deny or water down the concepts of evolution.
34. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!  
I disagree with the minimizing of the role Evolution plays in human history and science education. It is not debated in the Science community. The science standards of Arizona need to be compatible with modern scientific fact, not biases or religion. If Evolution is being wrongfully omitted I grieve to know what other facts the Arizona Department of Education will omit from Education. That is limiting future generations of American thinkers, who face scientific truths of the world and use the scientific method for progression of humanity. Please revise the k-12 science standards to fit current scientific fact, so that future generations will possess the knowledge they have the right to receive from their Education department. Thank you.
35. this section is good
36. see above
37. I couldn't care less about Fifth Grade.
38. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
39. TEACH EVOLUTION!
40. N/A
41. I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
42. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
43. Make sure the students know that geological changes to the earth can take millions or even billions of years.
44. Stick to actual science and stop dumbing down our children!
45. Needs to go back to review.
46. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
47. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
48. Evolution is not described nor incorporated accurately. This must be changed.
- 49.

50. We should only be covering evolution in school. Creationism should be kept separate from schools.
51. Send the standards back for review.
52. Explain evolution.
53. Include Evolution (where relevant), omit Creationism and "Intelligent Design".
54. Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
55. Reinstate evolution.
56. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
57. Refer reply in 20 above.
58. ....
59. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.
60. Continue to teach evolution. Do not remove it to teach creationism.
61. Include direct mention of evolution and scientifically rigorous treatment of evolution!
62. Evolution!
63. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
64. Refer to my response to question 17.
65. Teach proper evolution
66. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
67. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
68. Ambivalent.
69. Evolution
70. All standards need to be included.
71. No comment.
72. see previous comments.
73. See items 38 and 41 above.
74. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
75. Adding and maintaining teaching Evolution needs to be continued.
76. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
77. Teach Science and facts in Schools not faith and religion.
78. N/A
79. No comment.
80. Fix evolution standards.
81. See comment #9

82. N/a
83. Only facts based on repeatable scientific tests.
84. No need. Go with the scientific evidence not creationism or religious indoctrination!!
85. Please do not muddy the language regarding evolution
86. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
87. Teach Evolution
88. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
89. Revert all of Diane Douglas's changes.
90. evolution should be included in all grades
91. I wish more of what used to be in 5th grade standards could be taken out of the 6th grade earth and space science from the draft and added back in.
92. Ditto
93. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
94. Climate change, evolution, and big bang cosmology should be in these standards.
95. See above
96. Remove all religious references.
97. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
98. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.  
The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
99. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
100. Get a scientific expert to rewrite the content or undo the edits.
101. The Internal Review provided excellent additional development and clarification. The Internal Review should be adopted.
102. Clearly include the teaching of the concept of evolution.
103. Original language should remain
104. Teach evolution. Evolution is science.  
Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
105. Evolution is a scientific fact! To remove or try to water the process down from our education standards is unacceptable! If we want current or new high dollar business to come to Arizona we must have high standards for our school curriculum. Good and factual science is a must for our standards!
106. No comment
107. That school is for teaching facts, not for promoting the views of any particular religious group.
108. See above  
Those writing these standards should be experts in science and/or education.  
At a minimum they should understand what the word "THEORY" means in scientific terms.
109. Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
110. Get rid of "intelligent design." Restore references to evolution.

111. Never taught 5th  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or
112. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
113. Don't revise.  
Any change in curriculum de emphasizing the truth that evolution is a scientific fact, evidenced by the
114. replication of self copying dna in science labs and modern genetic engineering efforts is wrong.  
Period. Evolution through natural selection over millenia is a scientific fact.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering
115. down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
116. Climate change needs to be included  
Page 29, Fifth Grade Introduction: patterns of Sun, moon, and starts(!) Note that, unfortunately, other than in Second Grade there is nothing that mentions the Sun as a star and the properties of
117. stars (something that probably could have been introduced earlier than high school)  
Page 30, 5.E2U2.8: As with grade 2, to me, "gather" implies making observations (and looking up as appropriate) while "obtain" can mean looking it up in a book or on the Internet.
118. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
119. A fifth grader's level of understanding of the Theory of Evolution.
120. Standard 8: the parenthetical statement does not add anything to this standard
121. Teach our children science and not nonsense.
122. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually
123. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
124. See previous comments for earlier grades.
125. They can focus elsewhere with their improvements.
126. Please teach evolution and not creationism
127. SCIENTIFIC THEORY MUST BE TAUGHT
128. Teach evolution
129. This not the reason for my current comments.
130. Please do not make any changes or revisions to Fifth Grade 2018 Draft Earth and Space Science Standards.
131. Keep evolution. No creationism.  
I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
132. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
133. A simplified discussion of methodological naturalism should be introduced.
134. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.  
Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
135. not enough detail
136. not enough detail

137. Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
138. See comments above.
139. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
140. Climate Change being a reality and not a Hoax.
141. no comment
142. See previous comments
143. I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!  
It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
144. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
145. teach science not religious dogma  
Remove key concepts.
146. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.
147. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
148. see above
149. Fifth grade science standards are adequate.
150. <https://www.nextgenscience.org/>
151. Does not need any non scientific hypothesis such as creationism
152. See 19
153. Don't t over complicate things. Teach to the mid and lower range students.
154. Evolution should be taught, not creationism.
155. Adopt NGSS!
156. include the concept of the Big Ban. Include evolution and global warming
157. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
158. See previous comments.
159. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any others' religious beliefs out of the classroom!
160. I will not consider any changes if the teaching of evolution is in jeopardy including the word evolution. I have taken the time to read the proposal for every grade level.
161. These are sufficient
162. No religion in school
163. The constitution  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the
164. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
165. Not developmentally appropriate
166. keep evolution; reject intelligent design



167. include evolution as one valid scientific approach

168. As Above

169. na

170. N/A

**Total Respondents 170**

**48.** What would you like the working group to consider as they revise the Life Science Standards in the Fifth Grade Science Standards?

1. Some of the topics lead to discussions about evolution-- I personally don't have a problem with that, however, that is not always fully supported by the public.
2. Remove the key concepts as this unnecessary and is more about implementation and should NOT be the intention of the standards.
3. reproduction traits may not be appropriate for all 5th grade students as human growth and development varies by district and may not be taught until the end of the year. Is this in conjunction with the health standards? Is it different? Is it less specific? More information needs to be given
4. The curriculum and resources available
5. They are excellent, supporting not only content knowledge scientific argumentation and scientific practices.
6. Consider the major changes in the grade levels that you are making. In the current standards, fifth grade has skeletal, muscular and nervous systems. Under the new standards, only reproduction, life cycles, and genetics are included. That's a really big jump.
7. Please consider removing the key concepts section. This makes the model more like our PO model giving teachers a checklist, rather than leaving it 3 dimensional and inquiry based.
8. The idea of including humans in standard 5.L3U1.9 should be removed from the standard. It is not developmentally appropriate as students are not mature enough to have a discussion on this topic.
  1. Remove the reproduction standards. I believe 5th Graders lack the maturity to understand the concept and don't believe it's developmentally appropriate. These could also be controversial and some families may prefer to teach this material in the home.
  2. The jump from teaching the Skeletal System in 3rd Grade to Life Cycle, Reproduction and Genetics in 5th is a huge jump. How will students retain the information they were taught 2 years prior and what happens if it wasn't taught?
10. Consider the vast difference in what is being currently taught-including muscular, skeletal, nervous systems to just reproduction. Consider that reproduction is not an age appropriate concept.
11. no suggestions
12. Wait to Test.
13. Nothing in particular.
14. Nothing
15. Remove Key Concept Columns

Under the paragraph on Earth and Space Sciences, remove "position", under 5.E2U2.8 remove "(towards the center of the spherical Earth)", and under 5.L3U1.9 remove "can" and "the" that were all added by ADE. What did the teachers have here? Unless it was a grammatical fix, it should be returned to what the teachers asked for.

Page 32

In cell L1, U1, remove 3.L1U1.5 (see comment above about this standard).

In cell L1, U2, rename to 3.L1U2.5 (new number)

In cell L2, U2, rename to 3.L2U2.6 (new number)

In cell L2, U1, rename to 3.L2U1.7 (new number)

In cell L2, U3, rename to 3.L2U3.8 (new number)

In cell P4, U2, add 4.P4U2.1

16. Please revise the standard for 5.L3U1.6. They are too vague. There is no indication of how deep to take this standard. The key concepts column needs to remove "reproduction" as it applies to humans (and even animals). This age group is not ready for such lessons.
17. n/c
18. These 3 standards do not fit well with one another. 5th graders can't handle discussing body parts, let alone the effects of genetics on individuals. Will teachers need to use Punnett squares to teach? This is very vague and worrying. The idea of teaching selective breeding to 10-11 year olds is not okay. We can't handle talking about how babies are made, yet we are going to talk about breeding?
19. Simplification.
20. human development should not be allowed at this grade level
21. Reproduction traits are not appropriate for 5th grade students. Some of these concepts are political and can become tricky in a 5th grade classroom.
22. Human reproduction is NOT grade level appropriate. Also some of the new concepts here are political. Should not be taught in the classroom.
23. A more clearer perimeter to teach within. As well as teaching about reproduction in humans in a basic scientific concept.
24. Funding
25. Adopt NGSS standards
26. We should go back to the standards that the committee created and adopt those, not Diane Douglas's internal review copy.
27. Evolution section is weak and watered down. It needs to be strengthened.
28. n/a
29. No comment
30. I would like there to be an emphasis on this age group going outside, gardening, observing, going to enriching places in Science like the Botanical Garden, the zoo, National Parks, Science Museums, Outdoor classrooms.
31. Same comments as 2nd grade
32. Do not attempt to deny or water down the concepts of evolution.
33. STOP DENYING OUR KIDS A FULL EDUCATION WITH YOUR RELIGIOUS AGENDA!!! Evolution is real!
34. Language on evolution needs to make it clear what evolution is and why it is important, not to obscure that information.
35. see above
36. I couldn't care less about Fifth Grade.
37. Omitting information on change over time, evolution and the big bang theory, completely negates the validity of this document.
38. How will this create a solid knowledge without taking into account cells, cell division, and genetic trait linkage to chromosomes and DNA?
39. TEACH EVOLUTION!
40. N/A
41. Topics of genetic inheritance and effects of the environment on traits should be delayed until high school.
42. 5.L3U2.10 currently reads "Construct an explanation based on evidence that changes in an environment can affect the development of the traits in a population of organisms." This is inaccurate, confusing "development" with "evolution". Development occurs within an organism, evolution does not. I think it should read "Construct an explanation based on evidence that changes in an environment can affect the evolution of the traits in a population of organisms."

43. If evolution is a possible discussion, please word it appropriately. It is not a theory any longer.  
I Call for the restoration of the ASE's description of evolution, which is scientifically accurate and pedagogically appropriate, unlike the proposed revision.
44. I Recommend revisions to the treatment of evolution in passages that seem to have been similarly weakened (e.g., the omission of absolute ages in 8.E1U1.6, the use of the word "may" in HS+B.L4U1.19, the failure to use the e-word in HS+B.L4U2.20)
45. Stick to actual science and stop dumbing down our children!
46. Needs to go back to review.
47. Keep religious beliefs out of science standards and retain scientifically accurate core ideas of evolution and climate change at all grade levels.
48. Please revise.  
Science classes must include the scientific research published in high ranking, peer-reviewed journals of climate change, evolution, and mechanisms of natural selection if student are to have a better understanding of the scientific process, theories, and major mechanisms at work in our world. It is also essential preparation for higher education as these are subjects that will be taught heavily in entry level biology class, sometimes spanning an entire semester, and make up more advanced science course such as organic evolution. It is imperative to a student's education in science that large scientific fields such as evolution and climate change research not be censored like banned books.
- 49.
50. See previous comments on the treatment of evolutionary biology.
51. Evolution is not described nor incorporated accurately. This must be changed.
52. We should only be covering evolution in school. Creationism should be kept separate from schools.
53. 5.L3U2.10 Revise standard to "Construct an explanation based on evidence that changes in an environment can affect the frequencies of traits in a population of organisms." Reasoning: biologist mainly apply "development" to the life process of an individual organism, not to changes of the frequencies of traits in populations
54. Understanding the theory of evolution is critical to the fields of medicine, biology, and applied science like agriculture.
55. Don't eliminate references to evolution, as it's necessary to understand life sciences.
56. Understanding evolution is critical to the fields of medicine, biology, and applied science like agriculture.
57. Evolution must be taught
58. Send the standards back for review.
59. Explain evolution.
60. Include Evolution, omit ANY MENTION OF Creationism and "Intelligent Design".  
Teaching creationism, or the misnamed intelligent design, is a violation of the separation of church and state. If you want your kid to learn fantasy send him to Sunday school. Public schools are for fact based subjects that our kids will need to navigate the future, not the failed, undefined, and contradictory philosophies responsible for most of the earths problems.
- 61.
62. Reinstate evolution.  
This seems abstract for fifth grade: Construct an explanation based on evidence that changes in an environment can
63. affect the development of the traits in a population of organisms.  
Consider deleting that. What would this look like for fifth grade?
64. Not commenting here because my complaint is about Diane Douglas trying to sneak in creationism and "Intelligent Design" into the state science standards.
65. Refer reply in 20 above.
66. ....
67. Refer to the Next Generation Science Standards. They NGSS are good standards. These are not.

68. Continue to teach evolution. Do not remove it to teach creationism.
69. Include direct mention of evolution and scientifically rigorous treatment of evolution!
70. include evolution
71. Life Science standards should be strictly and wholly secular in nature and follow the most up to date science community's recommendations, including the proven theories on evolution and Darwinism. Our children need the opportunity to receive competitive and challenging educations at a playing field level to the rest of the nation and international STEM markets.
72. Refer to my response to question 17.
73. Darwin, please.  
5.L3U1.9 'patterns between the offspring' doesn't make grammatical/wording sense.  
  
5.L3U2.10 Biology distinguishes between 'development' within the life of individual organisms, i.e. going from egg to adult, and 'evolution', which describes change at a population level over generations. It seems here what is meant is evolution, not development, so the term should be replaced. (that would match with key concepts and mention of population, as well as long term patterns and genetic change mentioned in adjoining standards)
74. I like these a lot.
75. Strengthen the teaching of evolution and global change to reflect the science of these subjects.
76. Evolution is presented as a theory, which is technically incorrect, and the curriculum fails to mention other proposed explanations of origins and development.
77. Teach proper evolution
78. keep the evolution.
79. By 5th grade students need to understand the evolution is a fact. Not an opinion or theory.
80. Evolution, not intelligent design, is based in science. Science, not religion, should be taught in science classes.
81. Nothing should be taught within or alongside science that does not have the same factual basis that all the core concepts included in the draft have. Non-science or pseudoscience, has no place in factual science learning for our youth.
82. Evolution is NOT a theory!!!!  
Evolution as a theory is a religious belief, not a scientific concept.
83. Ambivalent.
84. L4
85. Evolution
86. **[No Answer Entered]**
87. All standards need to be included.
88. Evolution needs to be added back in as fact.
89. see previous comments.
90. See items 38 and 41 above.
91. NO CREATIONISM! NO INTELLIGENT DESIGN. NO UNCONSTITUTIONAL ADVANCEMENT OF RELIGION IN PUBLIC SCHOOLS. SCIENCE ONLY IN SCIENCE CLASS.
92. This seems to be the grade level when evolution is introduced, which seems a bit late in my opinion. Be that as it may, IT IS NOT A THEORY. Do NOT call it such, it is a fact. Teach it as a fact.
93. Adding and maintaining teaching Evolution needs to be continued.
94. See answers for Kindergarten. Actual SCIENCE would help. NOT RELIGION.
95. Teach Science and facts in Schools not faith and religion.
96. N/A
- 97.

98. No comment.
99. Fix evolution standards.
100. See comment #9
101. See first comment
102. De-emphasis of evolution does not advance science education. There is no scientific controversy about evolution.
103. N/a
104. See earlier general comments about the importance of including Evolution as the underlying explanation of all aspects of Biology.
105. Only facts based on repeatable scientific tests.
106. Use the word "evolution" and not "theory of evolution"
107. The unity and diversity of organisms, living and extinct, is the result of evolution.
108. No need. Go with the scientific evidence not creationism or religious indoctrination!!
109. Please do not muddy the language regarding evolution
110. Evolution has been amply confirmed by science, just like photosynthesis or relativity. It's absurd to use ambiguous or tentative language. These are very bad revisions that were made, they clearly weren't endorsed by the writing committee, and it's somewhat disrespectful to them to make these changes.  
  
Please don't avoid education on evolution.
111. Restore all original language referencing evolution proposed by the committee of educators with expertise in science education.
112. Teach Evolution
113. The original document, before internal review, provided the necessary background about what core concepts were expected in science education.
114. Revert all of Diane Douglas's changes.
115. evolution should be included in all grades  
  
Selective breeding, genetic information, adaptations, and mutations seem like heavy subjects to be learned in 5th grade. I think this is too young a grade for some of these subjects to be learned, not quite academically appropriate yet. Not sure how specific or in depth we are supposed to get either since the standards are not specific enough.
116. And body systems which is only addressed in 3rd grade per the new science standards draft should be added back into 5th or 6th grade as it was before. (5th grade used to have Central Nervous system, brain, skeletal and muscular systems)
117. They need to start learning about where they and everything came from, via evolution
118. Ditto
119. EVOLUTION IS ESSENTIAL SCIENCE ALL AGES SHOULD LEARN.
120. Climate change, evolution, and big bang cosmology should be in these standards.  
  
5.L3U2.10 - The wording in this standard is teleological and suggest that these changes can happen quickly. Remove the word "the" from "...affect the development of traits..." Suggested revision:
121. Construct an explanation based on evidence for how changed in an environment can affect the development of traits within a population of organisms over generations. This standard is also similar to 8.L4U2.11 and it is unclear what the boundaries are for the 5th-grade version.
122. See above
123. Remove all religious references.
124. Please see my earlier comments (Qu 13/17) regarding the scope of evolution education.

125. Science standards 5.L3U1.9, 5.L3U2.10, and 5.L3U3.11 are incompletely described and it is not clear how they are integrated. The current standards are written so that environmental change could be interpreted as a direct driver of the development of adaptive traits in the phenotype or genotype of an organism over a lifetime and passed to offspring. Experience teaching evolutionary concepts in tier 1 general education at the University of Arizona suggests to me that this is a common misconception among Arizona students. A correct and unambiguous conception of evolution is an essential for understanding science standards HS.L3U2.28, HS+B.L3U2.15, HS.L4U2.31, HS.B.L4U1.19, and HS.B.L4U2.20. Life science standards dealing with genetics, natural selection, and evolution should disambiguate the transmission of variability, the relative fitness of traits in a particular environment, and change in the frequency of traits over many generations. The concept described by these standards is more accurately summarized here. The chances of survival and reproduction (fitness) of organisms with different traits determines the frequency of traits in a population (natural selection). Variability in traits on which natural selection acts arise randomly in individuals and are genetically determined. Natural selection on variation results in the adaptation of populations to an environment and evolutionary change over many generations.
126. Evolution should not be omitted from this curricula.
127. Same as before.
128. Throw these terrible standards out and adopt instead the excellent Next Generation Science Standards developed by STEM professionals.
129. In 5.L3U2.10, the addition of "can" seems to be added in an attempt to downplay the role that environmental effects have on development of traits, though this could be an honest clarification. Also, the addition of "the" just makes the sentence clunky.
130. I believe it would serve the children of AZ better if we would just adopt the Next Generation Science Standards.
131. The sheer willful ignorance of removing Evolution from the curriculum is mind bogling. It would put Az students at a vast disadvantage when moving to higher education. If the superintendent's intention is to replace evolutionary theory with "intelligent design she should be removed from office and barred from working in education for life. Do not do this.
132. Get a scientific expert to rewrite the content or undo the edits.
133. The Internal Review provided excellent additional development and clarification. The Internal Review draft expands the thought processes of teachers and students in this area. The Internal Review should be adopted.
- What follows is repeated for grades 3-5 and is based on the "Distribution..." Table:  
" L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms."  
This is imprecise. In each section this should read "The study of evolution seeks to demonstrate..."  
First, evolution is an established scientific theory.  
A scientific theory differs from the "street" use of theory, which indicates a "guess" about causation or relationship. In contrast, a scientific theory can be tested and potentially disproved. These tests are rigorous observational or experimental attempts to demonstrate that the scientific theory cannot explain a pattern in nature. Failure to disprove or refute the scientific theory increases confidence in it, although it cannot be considered as proven.
134. Two things distinguish evolution as a "scientific theory" from the more general use of "theory." First, as inferred above, it can be tested and potentially falsified using experiment or observation. Second, it has been tested time and time again, in many systems and with many organisms, for well over 150 years, and has withstood those tests. It has not been disproven.  
Thus it is the STUDY of evolution – mechanisms of organic change, intrinsic or environmental characteristics driving or influencing the nature or rate of change, etc. (studies of which serve to "test" the underlying theory) – that have provided evidence of "the unity and diversity of living and extinct organisms."
135. Clearly include the teaching of the concept of evolution.
136. Original language should remain
137. Teach evolution. Evolution is science.
138. We need to start teaching children about all aspects of life including evolution from the very beginning.
139. 1.L3U2.9, and the identical standard in grades 5 and 8 ignore that some plants, notable two important desert plants, creosote and agaves, can also reproduce through cloning, producing plants that are genetically identical to the parent plant.



140. No comment
141. That school is for teaching facts, not for promoting the views of any particular religious group.
142. Environmental studies should include information regarding human impact.
143. See above  
Those writing these standards should be experts in science and/or education.  
At a minimum they should understand what the word "THEORY" means in scientific terms.
144.  
Eg: "Evolution is a confirmed scientific theory and understanding modern biology, agriculture, genetics and human development is impossible without reference to that established theory"
145. Get rid of "intelligent design." Restore references to evolution.
146. Never taught 5th  
Nothing in the proposed revisions for any grade are acceptable if they include "intelligent design" or
147. any other form of religious creationism by any other name, and if references to evolution have been deleted or treat it as "only a theory."
148. Don't revise.  
Scientific standards should be based on scientific research and nothing else. Replacing and watering down the proven science of evolution is a disservice to our kids, a disservice to our teachers, and a
149. disservice to our educational body. STOP TRYING TO ERASE SCIENCE WITH YOUR PERSONAL RELIGIOUS BELIEFS.
150. The inclusion of evolution must be reinstated.
151. Page 32, Table, Row labeled L4 – see comment 19 - #4.
152. Please teach about evolution too  
L4: The theory of evolution seeks to make clear the unity and diversity of living and extinct organisms.
153.  
See my comments on earlier page.
154. Evolution is not just a theory, it is well established fact by science. Making Biological evolution to "Theory of Evolution" is a step backwards not an improvement.
155. A fifth grader's level of understanding of the Theory of Evolution.
156. Standard 10. Can is an inappropriate addition. Changes to an environment DO affect the development of traits. Always! It may be at a negligible level, but it is ALWAYS at some level.
157. Teach our children science and not nonsense.
158. That intelligent Design is just one of several approaches to Life Science, and not the exclusive nor irrefutable means to explain development of any forms of life.
159. That is is unconstitutional to force children to learn "Intelligent Design" or Creationism in public schools.  
The new standards are unconstitutionally requiring creationism and minimizing and altering factually
160. based information about evolution. The place for religion is in the Church. The place for science and education is in the school.
161. See previous comments for earlier grades.
162. Eliminate any and all references to creationism at every level  
At this point it is difficult to continue discussing biology outside of the context of evolution which is
163. the driving force behind extinctions, changes due to climate etc. This should be implemented in the curriculum at this point.
164. I would like to see more Life Science Standards here, because it would better set students up for later grades.
165. Please teach evolution and not creationism
166. SCIENTIFIC THEORY MUST BE TAUGHT

167. Teach evolution
168. As above
169. More coverage of the E-word here, please.
170. This not the reason for my current comments.
171. Please do not make any changes or revisions to Fifth Grade 2018 Draft Life Science Standards.
172. Evolution.
- I DO NOT support the teaching of creationism in Arizona schools. Please keep religion out of our public schools and keep Science classes focused on "sense-making (as) a conceptual process in which
173. a learner actively engages with phenomena in the natural world to construct logical and coherent explanations that incorporate their current understanding of science, or a model that represents it, and are consistent with the available evidence." Evidence being the operative word.
174. Teach evolution as the foundation of biological science. Do not cover religion in public school standards as science.
175. Rigor in using the term "evolution" should continue with an emphasis on rigor in all scientific definitions.
176. Evolution is scientifically proven. Do not erase. Teaching god in school is 1950 thinking.
- Stop oppressing us with your Christian views. I am not a Christian and this is an obvious attack on science. Evolution is important for all students to learn . Keep your religious beliefs to yourself. Start up your own private school that teaches religion over evolution. Don't oppress us with your beliefs. It's raking away our liberty.
- 177.
178. not enough detail
- Science is evidence based. Pseudoscience and faith based speculation are not science! Diane Douglas
179. do your job! Stop trying to turn the the K-12 Arizona science curriculum into a soap box for your religious beliefs! Shame on you!
180. See comments above.
181. Sigh. Same. L4 "seeks to make clear." Please do not allow our students to receive a 19th century education.
182. Eliminate the nonscientific, last minute draft revisions done by the Superintendent and reinstate the work product of the science teaching workgroups.
183. Better understanding of different gender issues and the respect for them.
184. no comment
185. See previous comments
- Referring to evolution as only a "theory" when the vast majority of all biological standards we know
186. and teach is based on this is insulting and counterproductive to the teaching of science. Without establishing this as a foundation, the entire curriculum is undermined.
187. If the theory of evolution is in the standards, then the theory of intelligent design needs to also be included.
- I RECOMMEND YOU EXPLORE THE CURRENT CURRICULUM OF THE AWARD WINNING BASIS
188. SCHOOLS AND THE AWARD WINNING UNIVERSITY HIGH PROGRAM IN TUCSON. THEY ARE THE ONLY COMPETITIVE, NATIONALLY RANKED SCHOOLS I AM AWARE OF IN ARIZONA. DO YOUR HOMEWORK!
- It's wrong to accept Diane Douglas' politically and religiously motivated bid to remove references to evolution from the Science Standards. Evolution is a credible, verifiable scientific theory that is
189. accepted by the vast majority of scientist and scientific organizations. It should absolutely be taught to our children and should not be falsely portrayed as equal to or as credible as the non-scientific belief in "intelligent design."
190. teach science not religious dogma
191. Again, naturally- and human-caused climate change should be explicitly included in 5.L4U4.11
- Remove key concepts.
192. Refer to the Next generation Science Standards and A Framework for K-12 Science Education for grade level content development.

193. Do not present evolution as a theory.
194. Please refer to prior comment regarding the draft released March, 2018 vs the pre-internal review draft (i.e. the pre-internal review draft is acceptable, the March, 2018 draft is not)
195. Delete the words "theory of" in the Life Science section L4.
196. see above
197. Fifth grade science standards are adequate.
198. Drop the theory of evolution.
199. <https://www.nextgenscience.org/>
200. Does not need any non scientific hypothesis such as creationism
201. See 19
202. Evolutionary based data scientific data. Teach to the majority but don't make things so complex the mid and lower range students can't understand it.
203. conclusion: no religious....creationism....intelligent design in SCIENCE curriculum
204. Evolution should be taught, not creationism.
205. Teach that evolution is not a theory, but a fact.
206. Adopt NGSS!
207. include the concept of the Big Ban. Include evolution and global warming
208. DO NOT remove The Big Bang and evolution from our science curriculum! Those topics are REAL SCIENCE! Keep Ms Douglas' and any oethers' religious beliefs out of the classroom!
209. See previous comments.
210. In standard 5.L3U2.105 which reads: "Construct an explanation based on evidence that changes in an environment can affect the development of the traits in a population of organisms." Remove the added words "can" and "the" which make the sentence awkward. Additionally, add the words "evolution" and "natural selection" to key concepts, since these words are at the core of this standard.
211. This is adequate
212. Read the constitution!
213. The constitution
214. See my comments in no. 15  
To whom it may concern,  
  
As an infectious disease doctor, my patients' lives and limbs depend on my science knowledge. Protecting our country from biological warfare attacks, disease outbreaks, foodborne illness, diseases affecting our crops and natural disasters will be difficult or impossible without a science-educated workforce.  
I feel that it is very important for our students to learn basic science, including facts about evolution, gene technology, global warming and vaccines without interference from religious extremists or  
215. science deniers.  
Watering down science curriculum with religious nonsense does a disservice to our society, making our country less competitive with more reasonable nations, and less safe.  
  
Sincerely,  
  
Steven Oscherwitz MD  
Infectious Disease  
Tucson, Arizona  
  
Keep the same alignment with respect to the 14 core ideas. Some of the statement changes shift the  
216. standards focus from physical to life science, resulting in the physical science being lost. Keep the same sequence as determined by the committee.
217. Not developmentally appropriate

- 218. keep evolution; reject intelligent design
- 219. include evolution as one valid scientific approach
- 220. As Above
- 221. na
- 222. N/A

**Total Respondents 222**