

Computer Science Practices for Students

The content of the Arizona Computer Science Standards is intended to support the following seven practices for students. The practices describe the behaviors and ways of thinking that computationally literate students use to fully engage in a data-rich and interconnected world.

Practice Number	Practice	Description
1	Fostering an Inclusive Computing Culture	Students will develop skills for building an inclusive and diverse computing culture, which requires strategies for incorporating perspectives from people of different genders, ethnicities, and abilities. Incorporating these perspectives involves understanding the personal, ethical, social, economic, and cultural contexts in which people operate. Considering the needs of diverse users during the design process is essential to producing inclusive computational products.
2	Collaborating around Computing	Students will develop skills for collaborating around computing. Collaborative computing is the process of performing a computational task by working in pairs and on teams. Collaborative computing involves asking for the contributions and feedback of others, effective collaboration can lead to better outcomes than working independently. Collaboration requires individuals to navigate and incorporate diverse perspectives, conflicting ideas, disparate skills, and distinct personalities. Students should use collaborative tools to effectively work together and to create complex artifacts.
3	Recognizing and Defining Computational Problems	Students will develop skills for recognizing and defining computational problems. The ability to recognize appropriate and worthwhile opportunities to apply computation is a skill that develops over time and is central to computing. Solving a problem with a computational approach requires defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate.
4	Developing and Using Abstractions	Students will develop skills for developing and using abstractions. Identifying patterns and extracting common features from specific examples to create generalizations form abstractions. Using generalized solutions and parts of solutions designed for broad reuse simplifies the development process by managing complexity.
5	Creating Computational Artifacts	Students will develop skills for creating computational artifacts. The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps.
6	Testing and Refining Computational Artifacts	Students will develop skills for testing and refining computational artifacts. Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts.
7	Communicating about Computing	Students will develop skills for communicating about computing. Communication involves personal expression and exchanging ideas with others. In computer science, students communicate with diverse audiences about the use and effects of computation and the appropriateness of computational choices. Students write clear comments, document their work, and communicate their ideas through multiple forms of media. Clear communication includes using precise language and carefully considering possible audiences.

Computer Science Practice 1: Fostering an Inclusive Computing Culture

Students will develop skills for building an inclusive and diverse computing culture, which requires strategies for incorporating perspectives from people of different genders, ethnicities, and abilities. Incorporating these perspectives involves understanding the personal, ethical, social, economic, and cultural contexts in which people operate. Considering the needs of diverse users during the design process is essential to producing inclusive computational products.

Computer Science Practice 1 Sub Practices

- 1.1. Include the unique perspectives of others and reflect on one's own perspectives when designing and developing computational products.
- 1.2. Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability.
- 1.3. Employ self- and peer-advocacy to address bias in interactions, product design, and development methods.

Computer Science Sub Practices	EdTech Standard and Indicator			
<p>1.1. Include the unique perspectives of others and reflect on one's own perspectives when designing and developing computational products.</p>	Standard 2. Digital Citizen - Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.			
	K-2.2b. Students, with guidance, engage in positive and safe behavior when using devices and working online with others.	3-5.2.b. Students, in collaboration with an educator, identify and practice safe, legal and ethical behavior when using technology and interacting online.	6-8.2.b. Students demonstrate and advocate for positive, safe, legal, and ethical behavior when using technology and when interacting with others online.	9-12.2.b. Students engage in and advocate for positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.
	Standard 2. Digital Citizen - Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.			
	K-2.2.c. Students, with guidance, begin to develop an understanding of ownership, sharing of information, and how to respect the work of others.	3-5.2.c. Students, in collaboration with an educator, examine, use, and demonstrate respect for intellectual property including copyright, permission, and fair use, with both print and digital media when using and sharing the work of others.	6-8.2.c. Students demonstrate and advocate for an understanding of intellectual property including copyright, permission, and fair use by including appropriate citation and attribution elements.	9-12.2.c. Students demonstrate and advocate for an understanding of and respect for the rights and obligations of using and sharing intellectual property.
	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.d. Students, with guidance, select the appropriate technology for sharing their ideas with intended audiences.	3-5.6.d. Students, in collaboration with an educator, learn about and consider the intended audience when creating and publishing digital artifacts and presentations.	6-8.6.d. Students publish or present content designed for intended audiences and select platforms that effectively convey their ideas.	9-12.6.d. Students publish or present content that customizes the message and medium for their intended audiences.
<p>1.2. Address the needs of diverse end users during the design process to produce artifacts with broad accessibility and usability.</p>	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.b. Students with guidance, use technology to communicate with others to look at problems from different perspectives.	3-5.7.b. Students, in collaboration with an educator, use technology to connect with others, including peers, experts, and community members, to explore different points of view on various topics.	6-8.7.b. Students use collaborative technologies to connect with others, including peers, experts and community members, to learn about issues and problems or to gain a broader perspective.	9-12.7.b. Students use collaborative technologies to work with others, including peers, experts and or community members, to examine issues and problems from multiple viewpoints.
	Standard 2. Digital Citizen - Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.			
	K-2.2b. Students, with guidance, engage in positive and safe behavior when using devices and working online with others.	3-5.2.b. Students, in collaboration with an educator, identify and practice safe, legal and ethical behavior when using technology and interacting online.	6-8.2.b. Students demonstrate and advocate for positive, safe, legal, and ethical behavior when using technology and when interacting with others online.	9-12.2.b. Students engage in and advocate for positive, safe, legal, and ethical behavior when using technology, including social interactions online or when using networked devices.
	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.d. Students, with guidance, select the appropriate technology for sharing their ideas with intended audiences.	3-5.6.d. Students, in collaboration with an educator, learn about and consider the intended audience when creating and publishing digital artifacts and presentations.	6-8.6.d. Students publish or present content designed for intended audiences and select platforms that effectively convey their ideas.	9-12.6.d. Students publish or present content that customizes the message and medium for their intended audiences.
<p>1.3. Employ self- and peer-advocacy to address bias in interactions, product design, and development methods.</p>	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.a. Students, with guidance, use digital tools to work with other learners and get to know people within their local community and beyond.	3-5.7.a. Students, in collaboration with an educator, use digital tools to work with other learners, including those from a variety of backgrounds and cultures.	6-8.7.a. Students use digital tools to interact with others to develop a richer understanding of different perspectives and cultures.	9-12.7.a. Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in various ways that broaden mutual understanding and learning.
	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.d. Students, with guidance, use age-appropriate technology to work together to demonstrate an understanding of local or global issues and suggest possible solutions.	3-5.7.d. Students, in collaboration with an educator, work with others, using technology to explore local and global issues and identify possible solutions.	6-8.7.d. Students work with others, using collaborative technologies to explore local and global issues and investigate and advocate for possible solutions.	9-12.7.d. Students explore local and global issues and use collaborative technologies to work with others to investigate, develop, and advocate for solutions.

Computer Science Practice 2: Fostering an Inclusive Computing Culture				
Students will develop skills for collaborating around computing. Collaborative computing is the process of performing a computational task by working in pairs and on teams. Collaborative computing involves asking for the contributions and feedback of others, effective collaboration can lead to better outcomes than working independently. Collaboration requires individuals to navigate and incorporate diverse perspectives, conflicting ideas, disparate skills, and distinct personalities. Students should use collaborative tools to effectively work together and to create complex artifacts.				
Computer Science Practice 2 Sub Practices				
<ul style="list-style-type: none"> 2.1. Cultivate working relationships with individuals possessing diverse perspectives, skills, and personalities. 2.2. Create team norms, expectations, and equitable workloads to increase efficiency and effectiveness. 2.3. Solicit and incorporate feedback from, and provide constructive feedback to, team members and other stakeholders. 2.4. Evaluate and select technological tools that can be used to collaborate on a project. 				
Computer Science Sub Practices	EdTech Standard and Indicator			
<ul style="list-style-type: none"> 2.1. Cultivate working relationships with individuals possessing diverse perspectives, skills, and personalities. 	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.b. Students, with guidance, learn about technologies that can be used to connect to others and demonstrate the ability to link purpose with resources to enhance and customize their learning.	3-5.1.b. Students, in collaboration with an educator, build a network of experts and peers to customize their environments to enhance their learning, in accordance with school policy.	6-8.1.b. Students identify and begin to develop online networks of experts and peers to customize their learning environments in accordance with school policy.	9-12.1.b. Students build networks of experts and peers to customize their learning environment in ways that support the learning process and in accordance with school policy.
	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.c. Students, with guidance, take on various team roles and use age-appropriate technology to complete projects.	3-5.7.c. Students, in collaboration with an educator, take on various assigned team roles, contributing their knowledge of technology and content to complete a project or solve a problem.	6-8.7.c. Students perform a variety of roles within a team, using age-appropriate technology to complete a project or solve a problem.	9-12.7.c. Students contribute constructively to project teams, choosing various roles and responsibilities to work effectively toward a common goal
<ul style="list-style-type: none"> 2.2. Create team norms, expectations, and equitable workloads to increase efficiency and effectiveness. 	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.d. Students, with guidance, use age-appropriate technology to work together to demonstrate an understanding of local or global issues and suggest possible solutions.	3-5.7.d. Students, in collaboration with an educator, work with others, using technology to explore local and global issues and identify possible solutions.	6-8.7.d. Students work with others, using collaborative technologies to explore local and global issues and investigate and advocate for possible solutions.	9-12.7.d. Students explore local and global issues and use collaborative technologies to work with others to investigate, develop, and advocate for solutions.
	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.b. Students with guidance, use technology to communicate with others to look at problems from different perspectives.	3-5.7.b. Students, in collaboration with an educator, use technology to connect with others, including peers, experts, and community members, to explore different points of view on various topics.	6-8.7.b. Students use collaborative technologies to connect with others, including peers, experts and community members, to learn about issues and problems or to gain a broader perspective.	9-12.7.b. Students use collaborative technologies to work with others, including peers, experts and or community members, to examine issues and problems from multiple viewpoints.
<ul style="list-style-type: none"> 2.3. Solicit and incorporate feedback from, and provide constructive feedback to, team members and other stakeholders. 	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.c. Students, with guidance, take on various team roles and use age-appropriate technology to complete projects.	3-5.7.c. Students, in collaboration with an educator, take on various assigned team roles, contributing their knowledge of technology and content to complete a project or solve a problem.	6-8.7.c. Students perform a variety of roles within a team, using age-appropriate technology to complete a project or solve a problem.	9-12.7.c. Students contribute constructively to project teams, choosing various roles and responsibilities to work effectively toward a common goal
	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.d. Students, with guidance, use age-appropriate technology to work together to demonstrate an understanding of local or global issues and suggest possible solutions.	3-5.7.d. Students, in collaboration with an educator, work with others, using technology to explore local and global issues and identify possible solutions.	6-8.7.d. Students work with others, using collaborative technologies to explore local and global issues and investigate and advocate for possible solutions.	9-12.7.d. Students explore local and global issues and use collaborative technologies to work with others to investigate, develop, and advocate for solutions.
<ul style="list-style-type: none"> 2.4. Evaluate and select technological tools that can be used to collaborate on a project. 	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.c. Students, with guidance learn to recognize feedback from both people and features embedded in digital tools, and use age-appropriate technology to share learning.	3-5.1.c. Students, in collaboration with an educator, examine feedback from both people and the features embedded in digital tools, and use age-appropriate technology to share learning.	6-8.1.c. Students integrate feedback from people and digital tools to improve their learning process, and they select technology to demonstrate their learning in a variety of ways.	9-12.1.c. Students actively use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways..
	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.a. Students, with guidance, use digital tools to work with other learners and get to know people within their local community and beyond.	3-5.7.a. Students, in collaboration with an educator, use digital tools to work with other learners, including those from a variety of backgrounds and cultures.	6-8.7.a. Students use digital tools to interact with others to develop a richer understanding of different perspectives and cultures.	9-12.7.a. Students use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in various ways that broaden mutual understanding and learning.
<ul style="list-style-type: none"> 2.4 Evaluate and select technological tools that can be used to collaborate on a project. 	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.b. Students with guidance, use technology to communicate with others to look at problems from different perspectives.	3-5.7.b. Students, in collaboration with an educator, use technology to connect with others, including peers, experts, and community members, to explore different points of view on various topics.	6-8.7.b. Students use collaborative technologies to connect with others, including peers, experts and community members, to learn about issues and problems or to gain a broader perspective.	9-12.7.b. Students use collaborative technologies to work with others, including peers, experts and or community members, to examine issues and problems from multiple viewpoints.
	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.d. Students, with guidance, use age-appropriate technology to work together to demonstrate an understanding of local or global issues and suggest possible solutions.	3-5.7.d. Students, in collaboration with an educator, work with others, using technology to explore local and global issues and identify possible solutions.	6-8.7.d. Students work with others, using collaborative technologies to explore local and global issues and investigate and advocate for possible solutions.	9-12.7.d. Students explore local and global issues and use collaborative technologies to work with others to investigate, develop, and advocate for solutions.

Computer Science Practice 3: Recognizing and Defining Computational Problems

Students will develop skills for recognizing and defining computational problems. The ability to recognize appropriate and worthwhile opportunities to apply computation is a skill that develops over time and is central to computing. Solving a problem with a computational approach requires defining the problem, breaking it down into parts, and evaluating each part to determine whether a computational solution is appropriate.

Computer Science Practice 3 Sub Practices

- 3.1. Identify complex, interdisciplinary, real-world problems that can be solved computationally.
- 3.2. Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures.
- 3.3. Evaluate whether it is appropriate and feasible to solve a problem computationally.

Computer Science Sub Practices	EdTech Standard and Indicator			
<p>3.1. Identify complex, interdisciplinary, real-world problems that can be solved computationally.</p>	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.a. Students, with guidance, consider and set personal learning goals and utilize appropriate technology to demonstrate knowledge and reflect on the learning process.	3-5.1.a. Students in collaboration with an educator, develop learning goals, select the technology tools to achieve them, and reflect on and revise the learning process as needed to achieve goals.	6-8.1.a. Students articulate personal learning goals, select, and manage appropriate technologies to achieve them, and reflect on their successes and areas of improvement in working toward their goals.	9-12.1.a. Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.a. Students, with guidance, identify a problem and select appropriate technology tools to explore and find solutions.	3-5.5.a. Students, in collaboration with an educator, identify, explore or solve problems by selecting technology for data analysis, modeling, and algorithmic thinking.	6-8.5.a. Students practice defining and solving problems by selecting technology for data analysis, modeling, and algorithmic thinking.	9-12.5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
	K-2.5.d. Students discuss and develop an understanding of how technology is used to make a task easier or repeatable and can identify real-world examples.	3-5.5.d. Students understand and explore basic concepts related to automation, patterns, and algorithmic thinking.	6-8.5.d. Students understand how automation works and apply algorithmic thinking to design and automate solutions.	9-12.5.d. Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.
<p>3.2. Decompose complex real-world problems into manageable subproblems that could integrate existing solutions or procedures.</p>	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.b. Students, with guidance, analyze age-appropriate data and look for similarities in order to identify patterns and categories.	3-5.5.b. Students, in collaboration with an educator, select effective technology to represent and organize data.	6-8.5.b. Students find and organize data and use technology to analyze and represent it to solve problems and make decisions.	9-12.5.b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.c. Students, with guidance, break a problem into parts and identify ways to solve the problem.	3-5.5.c. Students, in collaboration with an educator, break down problems into smaller parts, identify key information, and propose solutions.	6-8.5.c. Students break problems into component parts, identify key pieces, and use that information to solve problems.	9-12.5.c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
<p>3.3. Evaluate whether it is appropriate and feasible to solve a problem computationally.</p>	K-2.1.a. Students, with guidance, consider and set personal learning goals and utilize appropriate technology to demonstrate knowledge and reflect on the learning process.	3-5.1.a. Students in collaboration with an educator, develop learning goals, select the technology tools to achieve them, and reflect on and revise the learning process as needed to achieve goals.	6-8.1.a. Students articulate personal learning goals, select, and manage appropriate technologies to achieve them, and reflect on their successes and areas of improvement in working toward their goals.	9-12.1.a. Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.d. Students discuss and develop an understanding of how technology is used to make a task easier or repeatable and can identify real-world examples.	3-5.5.d. Students understand and explore basic concepts related to automation, patterns, and algorithmic thinking.	6-8.5.d. Students understand how automation works and apply algorithmic thinking to design and automate solutions.	9-12.5.d. Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Computer Science Practice 4: Developing and Using Abstractions				
Students will develop skills for developing and using abstractions. Identifying patterns and extracting common features from specific examples to create generalizations form abstractions. Using generalized solutions and parts of solutions designed for broad reuse simplifies the development process by managing complexity.				
Computer Science Practice 4 Sub Practices				
<ul style="list-style-type: none"> 4.1. Extract common features from a set of interrelated processes or complex phenomena. 4.2. Evaluate existing technological functionalities and incorporate them into new designs. 4.3. Create modules and develop points of interaction that can apply to multiple situations and reduce complexity. 4.4. Model phenomena and processes and simulate systems to understand and evaluate potential outcomes. 				
Computer Science Sub Practices	EdTech Standard and Indicator			
<ul style="list-style-type: none"> 4.1. Extract common features from a set of interrelated processes or complex phenomena. 	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.d. Students, with guidance, learn to recognize commonalities and fundamental structures across digital tools and begin to transfer learning between tools or learning environments.	3-5.1.d. Students explore age appropriate technologies and begin to transfer their learning to different tools or learning environments.	6-8.1.d. Students navigate a variety of technologies and transfer their skills to troubleshoot and learn how to use new technologies.	9-12.1.d. Students choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore new technologies.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.a. Students, with guidance, ask questions, suggest solutions, test ideas to solve problems, and share their learning.	3-5.4.a. Students, in collaboration with an educator, explore and practice a design process by generating ideas to solve a problem by planning, creating and testing innovative products that are shared with others.	6-8.4.a. Students engage in a design process for generating and testing ideas and developing innovative products to solve problems.	9-12.4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
K-2.4.c. Students, with guidance, use a design process to develop ideas or creations, test their design, and redesign as necessary.	3-5.4.c. Students, in collaboration with an educator, engage in a cyclical design process to develop, test and refine prototypes and reflect on the role that trial and error plays.	6-8.4.c. Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement.	9-12.4.c. Students develop, test and refine prototypes as part of a cyclical design process.	
Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.				
K-2.5.d. Students discuss and develop an understanding of how technology is used to make a task easier or repeatable and can identify real-world examples.	3-5.5.d. Students understand and explore basic concepts related to automation, patterns, and algorithmic thinking.	6-8.5.d. Students understand how automation works and apply algorithmic thinking to design and automate solutions.	9-12.5.d. Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.	
<ul style="list-style-type: none"> 4.2. Evaluate existing technological functionalities and incorporate them into new designs. 	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.d. Students, with guidance, learn to recognize commonalities and fundamental structures across digital tools and begin to transfer learning between tools or learning environments.	3-5.1.d. Students explore age appropriate technologies and begin to transfer their learning to different tools or learning environments.	6-8.1.d. Students navigate a variety of technologies and transfer their skills to troubleshoot and learn how to use new technologies.	9-12.1.d. Students choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore new technologies.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.b. Students, with guidance, use age appropriate digital and/or non digital tools to describe the steps in a design process.	3-5.4.b. Students, in collaboration with an educator, use digital and/or non-digital tools to plan and manage a design process.	6-8.4.b. Students select and use digital tools to support a design process and expand their understanding to identify constraints and trade-offs and to weigh risks.	9-12.4.b. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
K-2.4.c. Students, with guidance, use a design process to develop ideas or creations, test their design, and redesign as necessary.	3-5.4.c. Students, in collaboration with an educator, engage in a cyclical design process to develop, test and refine prototypes and reflect on the role that trial and error plays.	6-8.4.c. Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement.	9-12.4.c. Students develop, test and refine prototypes as part of a cyclical design process.	
<ul style="list-style-type: none"> 4.3. Create modules and develop points of interaction that can apply to multiple situations and reduce complexity. 	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.d. Students, with guidance, learn to recognize commonalities and fundamental structures across digital tools and begin to transfer learning between tools or learning environments.	3-5.1.d. Students explore age appropriate technologies and begin to transfer their learning to different tools or learning environments.	6-8.1.d. Students navigate a variety of technologies and transfer their skills to troubleshoot and learn how to use new technologies.	9-12.1.d. Students choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore new technologies.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.a. Students, with guidance, ask questions, suggest solutions, test ideas to solve problems, and share their learning.	3-5.4.a. Students, in collaboration with an educator, explore and practice a design process by generating ideas to solve a problem by planning, creating and testing innovative products that are shared with others.	6-8.4.a. Students engage in a design process for generating and testing ideas and developing innovative products to solve problems.	9-12.4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
K-2.4.c. Students, with guidance, use a design process to develop ideas or creations, test their design, and redesign as necessary.	3-5.4.c. Students, in collaboration with an educator, engage in a cyclical design process to develop, test and refine prototypes and reflect on the role that trial and error plays.	6-8.4.c. Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement.	9-12.4.c. Students develop, test and refine prototypes as part of a cyclical design process.	
<ul style="list-style-type: none"> 4.4. Model phenomena and processes and simulate systems to understand and evaluate potential outcomes. 	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.a. Students, with guidance, ask questions, suggest solutions, test ideas to solve problems, and share their learning.	3-5.4.a. Students, in collaboration with an educator, explore and practice a design process by generating ideas to solve a problem by planning, creating and testing innovative products that are shared with others.	6-8.4.a. Students engage in a design process for generating and testing ideas and developing innovative products to solve problems.	9-12.4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.d. Students discuss and develop an understanding of how technology is used to make a task easier or repeatable and can identify real-world examples.	3-5.5.d. Students understand and explore basic concepts related to automation, patterns, and algorithmic thinking.	6-8.5.d. Students understand how automation works and apply algorithmic thinking to design and automate solutions.	9-12.5.d. Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

Computer Science Practice 5: Creating Computational Artifacts				
Students will develop skills for creating computational artifacts. The process of developing computational artifacts embraces both creative expression and the exploration of ideas to create prototypes and solve computational problems. Students create artifacts that are personally relevant or beneficial to their community and beyond. Computational artifacts can be created by combining and modifying existing artifacts or by developing new artifacts. Examples of computational artifacts include programs, simulations, visualizations, digital animations, robotic systems, and apps.				
Computer Science Practice 5 Sub Practices				
<ul style="list-style-type: none"> 5.1. Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations. 5.2. Create a computational artifact for practical intent, personal expression, or to address a societal issue. 5.3. Modify an existing artifact to improve or customize it. 				
Computer Science Sub Practices	EdTech Standard and Indicator			
5.1. Plan the development of a computational artifact using an iterative process that includes reflection on and modification of the plan, taking into account key features, time and resource constraints, and user expectations.	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.a. Students, with guidance, ask questions, suggest solutions, test ideas to solve problems, and share their learning.	3-5.4.a. Students, in collaboration with an educator, explore and practice a design process by generating ideas to solve a problem by planning, creating and testing innovative products that are shared with others.	6-8.4.a. Students engage in a design process for generating and testing ideas and developing innovative products to solve problems.	9-12.4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.c. Students, with guidance, use a design process to develop ideas or creations, test their design, and redesign as necessary.	3-5.4.c. Students, in collaboration with an educator, engage in a cyclical design process to develop, test and refine prototypes and reflect on the role that trial and error plays.	6-8.4.c. Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement.	9-12.4.c. Students develop, test and refine prototypes as part of a cyclical design process.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.d. Students demonstrate perseverance when working to complete a challenging task.	3-5.4.d. Students demonstrate perseverance when working with open-ended problems.	6-8.4.d. Students demonstrate an ability to persevere and handle greater ambiguity as they work to solve open-ended problems.	9-12.4.d. Students exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.
	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.c. Students, with guidance, create digital artifacts to share ideas in multiple formats.	3-5.6.c. Students, in collaboration with an educator, create digital artifacts using digital tools to communicate ideas visually, graphically, and/or auditorily.	6-8.6.c. Students create artifacts using digital tools to communicate complex ideas textually, visually, graphically, and auditorily.	9-12.6.c. Students communicate complex ideas clearly using various digital tools to convey the concepts textually, visually, graphically, etc.
	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.d. Students, with guidance, select the appropriate technology for sharing their ideas with intended audiences.	3-5.6.d. Students, in collaboration with an educator, learn about and consider the intended audience when creating and publishing digital artifacts and presentations.	6-8.6.d. Students publish or present content designed for intended audiences and select platforms that effectively convey their ideas.	9-12.6.d. Students publish or present content that customizes the message and medium for their intended audiences.
5.2. Create a computational artifact for practical intent, personal expression, or to address a societal issue.	Standard 3. Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.			
	K-2.3.c. Students, with guidance, use a variety of provided tools to organize information and make connections to their learning.	3-5.3.c. Students, in collaboration with an educator, use a variety of strategies to collect and organize information and make meaningful connections between resources.	6-8.3.c. Students locate and collect a variety of resources and organize information to make meaningful connections.	9-12.3.c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
	Standard 3. Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.			
	K-2.3.d. Students, with guidance, explore real-world issues and share their ideas about them with others.	3-5.3.d. Students, in collaboration with an educator, explore real world problems and issues and collaborate with others to find answers or solutions.	6-8.3.d. Students explore real world problems and issues and actively pursue solutions for them.	9-12.3.d. Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.
	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.a. Students, with guidance, use a variety of tools for creating something new and communicating with others.	3-5.6.a. Students, in collaboration with an educator, recognize and utilize the features and functions of a variety of creation or communication tools.	6-8.6.a. Students select appropriate platforms and tools to create, share, and communicate their work effectively.	9-12.6.a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.b. Students, with guidance, create original works using digital tools and resources.	3-5.6.b. Students, in collaboration with an educator, create original works and learn strategies for responsibly repurposing and remixing to create new artifacts.	6-8.6.b. Students create original works or responsibly repurpose digital resources into new creative works.	9-12.6.b. Students create original works or responsibly repurpose or remix digital resources into new creations.
	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.c. Students, with guidance, create digital artifacts to share ideas in multiple formats.	3-5.6.c. Students, in collaboration with an educator, create digital artifacts using digital tools to communicate ideas visually, graphically, and/or auditorily.	6-8.6.c. Students create artifacts using digital tools to communicate complex ideas textually, visually, graphically, and auditorily.	9-12.6.c. Students communicate complex ideas clearly using various digital tools to convey the concepts textually, visually, graphically, etc.
Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.				
K-2.6.d. Students, with guidance, select the appropriate technology for sharing their ideas with intended audiences.	3-5.6.d. Students, in collaboration with an educator, learn about and consider the intended audience when creating and publishing digital artifacts and presentations.	6-8.6.d. Students publish or present content designed for intended audiences and select platforms that effectively convey their ideas.	9-12.6.d. Students publish or present content that customizes the message and medium for their intended audiences.	
Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.				
K-2.7.d. Students, with guidance, use age-appropriate technology to work together to demonstrate an understanding of local or global issues and suggest possible solutions.	3-5.7.d. Students, in collaboration with an educator, work with others, using technology to explore local and global issues and identify possible solutions.	6-8.7.d. Students work with others, using collaborative technologies to explore local and global issues and investigate and advocate for possible solutions.	9-12.7.d. Students explore local and global issues and use collaborative technologies to work with others to investigate, develop, and advocate for solutions.	
5.3. Modify an existing artifact to improve or customize it.	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.d. Students, with guidance, learn to recognize commonalities and fundamental structures across digital tools and begin to transfer learning between tools or learning environments.	3-5.1.d. Students explore age appropriate technologies and begin to transfer their learning to different tools or learning environments.	6-8.1.d. Students navigate a variety of technologies and transfer their skills to troubleshoot and learn how to use new technologies.	9-12.1.d. Students choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore new technologies.
	Standard 3. Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.			
	K-2.3.c. Students, with guidance, use a variety of provided tools to organize information and make connections to their learning.	3-5.3.c. Students, in collaboration with an educator, use a variety of strategies to collect and organize information and make meaningful connections between resources.	6-8.3.c. Students locate and collect a variety of resources and organize information to make meaningful connections.	9-12.3.c. Students curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.c. Students, with guidance, break a problem into parts and identify ways to solve the problem.	3-5.5.c. Students, in collaboration with an educator, break down problems into smaller parts, identify key information, and propose solutions.	6-8.5.c. Students break problems into component parts, identify key pieces, and use that information to solve problems.	9-12.5.c. Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.				
K-2.6.b. Students, with guidance, create original works using digital tools and resources.	3-5.6.b. Students, in collaboration with an educator, create original works and learn strategies for responsibly repurposing and remixing to create new artifacts.	6-8.6.b. Students create original works or responsibly repurpose digital resources into new creative works.	9-12.6.b. Students create original works or responsibly repurpose or remix digital resources into new creations.	

Computer Science Practice 6: Testing and Refining Computational Artifacts

Students will develop skills for testing and refining computational artifacts. Testing and refinement is the deliberate and iterative process of improving a computational artifact. This process includes debugging (identifying and fixing errors) and comparing actual outcomes to intended outcomes. Students also respond to the changing needs and expectations of end users and improve the performance, reliability, usability, and accessibility of artifacts.

Computer Science Practice 6 Sub Practices

- 6.1. Systematically test computational artifacts by considering all scenarios and using test cases.
- 6.2. Identify and fix errors using a systematic process.
- 6.3. Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility.

Computer Science Sub Practices	EdTech Standard and Indicator			
<p>6.1. Systematically test computational artifacts by considering all scenarios and using test cases.</p>	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.d. Students, with guidance, learn to recognize commonalities and fundamental structures across digital tools and begin to transfer learning between tools or learning environments.	3-5.1.d. Students explore age appropriate technologies and begin to transfer their learning to different tools or learning environments.	6-8.1.d. Students navigate a variety of technologies and transfer their skills to troubleshoot and learn how to use new technologies.	9-12.1.d. Students choose, use and troubleshoot current technologies, and are able to transfer their knowledge to explore new technologies.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.a. Students, with guidance, ask questions, suggest solutions, test ideas to solve problems, and share their learning.	3-5.4.a. Students, in collaboration with an educator, explore and practice a design process by generating ideas to solve a problem by planning, creating and testing innovative products that are shared with others.	6-8.4.a. Students engage in a design process for generating and testing ideas and developing innovative products to solve problems.	9-12.4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.c. Students, with guidance, use a design process to develop ideas or creations, test their design, and redesign as necessary.	3-5.4.c. Students, in collaboration with an educator, engage in a cyclical design process to develop, test and refine prototypes and reflect on the role that trial and error plays.	6-8.4.c. Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement.	9-12.4.c. Students develop, test and refine prototypes as part of a cyclical design process.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.a. Students, with guidance, identify a problem and select appropriate technology tools to explore and find solutions.	3-5.5.a. Students, in collaboration with an educator, identify, explore or solve problems by selecting technology for data analysis, modeling, and algorithmic thinking.	6-8.5.a. Students practice defining and solving problems by selecting technology for data analysis, modeling, and algorithmic thinking.	9-12.5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.b. Students, with guidance, analyze age-appropriate data and look for similarities in order to identify patterns and categories.	3-5.5.b. Students, in collaboration with an educator, select effective technology to represent and organize data.	6-8.5.b. Students find and organize data and use technology to analyze and represent it to solve problems and make decisions.	9-12.5.b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
<p>6.2. Identify and fix errors using a systematic process.</p>	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.c. Students, with guidance, use a design process to develop ideas or creations, test their design, and redesign as necessary.	3-5.4.c. Students, in collaboration with an educator, engage in a cyclical design process to develop, test and refine prototypes and reflect on the role that trial and error plays.	6-8.4.c. Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement.	9-12.4.c. Students develop, test and refine prototypes as part of a cyclical design process.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.d. Students discuss and develop an understanding of how technology is used to make a task easier or repeatable and can identify real-world examples.	3-5.5.d. Students understand and explore basic concepts related to automation, patterns, and algorithmic thinking.	6-8.5.d. Students understand how automation works and apply algorithmic thinking to design and automate solutions.	9-12.5.d. Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.
<p>6.3. Evaluate and refine a computational artifact multiple times to enhance its performance, reliability, usability, and accessibility.</p>	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.a. Students, with guidance, ask questions, suggest solutions, test ideas to solve problems, and share their learning.	3-5.4.a. Students, in collaboration with an educator, explore and practice a design process by generating ideas to solve a problem by planning, creating and testing innovative products that are shared with others.	6-8.4.a. Students engage in a design process for generating and testing ideas and developing innovative products to solve problems.	9-12.4.a. Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.
	Standard 4. Innovative Designer - Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.			
	K-2.4.c. Students, with guidance, use a design process to develop ideas or creations, test their design, and redesign as necessary.	3-5.4.c. Students, in collaboration with an educator, engage in a cyclical design process to develop, test and refine prototypes and reflect on the role that trial and error plays.	6-8.4.c. Students engage in a design process to develop, test, and revise prototypes, embrace the iterative process of trial and error, and understand setbacks as potential opportunities for improvement.	9-12.4.c. Students develop, test and refine prototypes as part of a cyclical design process.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.a. Students, with guidance, identify a problem and select appropriate technology tools to explore and find solutions.	3-5.5.a. Students, in collaboration with an educator, identify, explore or solve problems by selecting technology for data analysis, modeling, and algorithmic thinking.	6-8.5.a. Students practice defining and solving problems by selecting technology for data analysis, modeling, and algorithmic thinking.	9-12.5.a. Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models, and algorithmic thinking in exploring and finding solutions.
	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
K-2.5.b. Students, with guidance, analyze age-appropriate data and look for similarities in order to identify patterns and categories.	3-5.5.b. Students, in collaboration with an educator, select effective technology to represent and organize data.	6-8.5.b. Students find and organize data and use technology to analyze and represent it to solve problems and make decisions.	9-12.5.b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.	

Computer Science Practice 7: Communicating About Computing

Students will develop skills for communicating about computing. Communication involves personal expression and exchanging ideas with others. In computer science, students communicate with diverse audiences about the use and effects of computation and the appropriateness of computational choices. Students write clear comments, document their work, and communicate their ideas through multiple forms of media. Clear communication includes using precise language and carefully considering possible audiences.

Computer Science Practice 6 Sub Practices

- ☉ 7.1. Select, organize, and interpret large data sets from multiple sources to support a claim.
- ☉ 7.2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose.
- ☉ 7.3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution.

Computer Science Sub Practices	EdTech Standard and Indicator			
☉ 7.1. Select, organize, and interpret large data sets from multiple sources to support a claim.	Standard 1. Empowered Learner - Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.			
	K-2.1.c. Students, with guidance, learn to recognize feedback from both people and features embedded in digital tools, and use age appropriate technology to share learning.	3-5.1.c. Students, in collaboration with an educator, examine feedback from both people and the features embedded in digital tools, and use age appropriate technology to share learning.	6-8.1.c. Students integrate feedback from people and digital tools to improve their learning process, and they select technology to demonstrate their learning in a variety of ways.	9-12.1.c. Students actively use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
☉ 7.2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose.	Standard 5. Computational Thinker - Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.			
	K-2.5.b. Students, with guidance, analyze age-appropriate data and look for similarities in order to identify patterns and categories.	3-5.5.b. Students, in collaboration with an educator, select effective technology to represent and organize data.	6-8.5.b. Students find and organize data and use technology to analyze and represent it to solve problems and make decisions.	9-12.5.b. Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.
☉ 7.2. Describe, justify, and document computational processes and solutions using appropriate terminology consistent with the intended audience and purpose.	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.a. Students, with guidance, use a variety of tools for creating something new and communicating with others.	3-5.6.a. Students, in collaboration with an educator, recognize and utilize the features and functions of a variety of creation or communication tools.	6-8.6.a. Students select appropriate platforms and tools to create, share, and communicate their work effectively.	9-12.6.a. Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
☉ 7.3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution.	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.d. Students, with guidance, select the appropriate technology for sharing their ideas with intended audiences.	3-5.6.d. Students, in collaboration with an educator, learn about and consider the intended audience when creating and publishing digital artifacts and presentations.	6-8.6.d. Students publish or present content designed for intended audiences and select platforms that effectively convey their ideas.	9-12.6.d. Students publish or present content that customizes the message and medium for their intended audiences.
☉ 7.3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution.	Standard 2. Digital Citizen - Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.			
	K-2.2.a. Students, with guidance, discuss and develop their digital identity through responsible use of technology.	3-5.2.a. Students demonstrate an understanding of the role a digital identity plays in the digital world and learn the permanence of their decisions when interacting online.	6-8.2.a. Students cultivate their digital identities and reputations within a digital environment and understand that digital actions are permanent.	9-12.2.a. Students cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.
☉ 7.3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution.	Standard 2. Digital Citizen - Students recognize the rights, responsibilities, and opportunities of living, learning, and working in an interconnected digital world, and they act and model in ways that are safe, legal, and ethical.			
	K-2.2.c. Students, with guidance, begin to develop an understanding of ownership, sharing of information, and how to respect the work of others.	3-5.2.c. Students, in collaboration with an educator, examine, use, and demonstrate respect for intellectual property including copyright, permission, and fair use, with both print and digital media when using and sharing the work of others.	6-8.2.c. Students demonstrate and advocate for an understanding of intellectual property including copyright, permission, and fair use by including appropriate citation and attribution elements.	9-12.2.c. Students demonstrate and advocate for an understanding of and respect for the rights and obligations of using and sharing intellectual property.
☉ 7.3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution.	Standard 3. Knowledge Constructor - Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts, and make meaningful learning experiences for themselves and others.			
	K-2.3.b. Students, with guidance, become familiar with age-appropriate criteria for evaluating digital content.	3-5.3.b. Students, in collaboration with an educator, learn how to evaluate sources for accuracy, perspective, credibility, and relevance.	6-8.3.b. Students practice evaluating the accuracy, perspective, credibility, and relevance of information, media, data or other resources.	9-12.3.b. Students evaluate the accuracy, perspective, credibility, and relevance of information, media, data or other resources.
☉ 7.3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution.	Standard 6. Creative Communicator - Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats and digital media appropriate to their goals.			
	K-2.6.c. Students, with guidance, create digital artifacts to share ideas in multiple formats.	3-5.6.c. Students, in collaboration with an educator, create digital artifacts using digital tools to communicate ideas visually, graphically, and/or auditorily.	6-8.6.c. Students create artifacts using digital tools to communicate complex ideas textually, visually, graphically, and auditorily.	9-12.6.c. Students communicate complex ideas clearly using various digital tools to convey the concepts textually, visually, graphically, etc.
☉ 7.3. Articulate ideas responsibly by observing intellectual property rights and giving appropriate attribution.	Standard 7. Global Collaborator - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.			
	K-2.7.b. Students with guidance, use technology to communicate with others to look at problems from different perspectives.	3-5.7.b. Students, in collaboration with an educator, use technology to connect with others, including peers, experts, and community members, to explore different points of view on various topics.	6-8.7.b. Students use collaborative technologies to connect with others, including peers, experts and community members, to learn about issues and problems or to gain a broader perspective.	9-12.7.b. Students use collaborative technologies to work with others, including peers, experts and or community members, to examine issues and problems from multiple viewpoints.