Arizona Science Standards - 3rd Grade

Three Dimensions of Science

Sensemaking in science occurs with the integration of three essential dimensions.

Science and Engineering Practices

- ask questions and define problems
- develop and use models
- plan and carry out investigations
- analyze and interpret data
- use mathematics and computational thinking
- construct explanations and design solutions
- engage in argument from evidence
- obtain, evaluate, and communicate information

Crosscutting Concepts

- patterns
- cause and effect
- structure and function
- systems and system models
- stability and change
- scale, proportion, and quantity
- energy and matter

Core Ideas

Core Ideas for Knowing Science

Physical Science

P1: All matter in the Universe is made of very small particles.

P2: Objects can affect other objects at a distance.

P3: Changing the movement of an object requires a net force to be acting on it.

P4: The total amount of energy in a closed system is always the same but can be transferred from one energy store to another during an event.

Earth and Space Science

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.

E2: The Earth and our solar system are a very small part of one of many galaxies within the Universe.

Life Science

L1: Organisms are organized on a cellular basis and have a finite life span.

L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.

L3: Genetic information is passed down from one generation of organisms to another.

L4: The unity and diversity of organisms, living and extinct, is the result of evolution.

Core Ideas for Using Science

U1: Scientists explain phenomena using evidence obtained from observations and or scientific investigations. Evidence may lead to developing models and or theories to make sense of phenomena. As new evidence is discovered, models and theories can be revised.

U2: The knowledge produced by science is used in engineering and technologies to solve problems and/or create products.

U3: Applications of science often have both positive and negative ethical, social, economic, and/or political implications.

Physical Science Standards

Students develop an understanding of the sources, properties, and characteristics of energy along with the relationship between energy transfer and the human body.

3.P2U1.1	Ask questions and investigate the relationship between light, objects, and the human eye.
3.P2U1.2	Plan and carry out an investigation to explore how sound waves affect objects at varying distances.
3.P4U1.3	Develop and use models to describe how light and sound waves transfer energy.

Earth and Space Science Standards

Students develop an understanding of how the Sun provides light and energy for Earth systems.

3.E1U1.4	Construct an explanation describing how the Sun is the primary source of energy impacting Earth systems.

Phenomena are observable events that can be explained or explored. Science aims to explain the causes of these events, or phenomena, using scientific ideas, concepts, and practices (3-dimensions).

Life Science Standards

Students develop an understanding of the flow of energy in a system beginning with the Sun to and among organisms They also understand that plants and animals (including humans) have specialized internal and external structures and can respond to stimuli to increase survival.

3.L1U1.5	Develop and use models to explain that plants and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.
3.L1U1.6	Plan and carry out investigations to demonstrate ways plants and animals react to stimuli.
3.L2U1.7	Develop and use system models to describe the flow of energy from the Sun to and among living organisms.
3.L2U1.8	Construct an argument from evidence that organisms are interdependent.

Key Crosscutting Concepts in 3rd Grade

*Patterns; **Cause and Effect**; Scale, Proportion and Quantity; Systems and System Models; Energy and Matter; Structure and Function; **Stability and Change***

ARIZONA Department of Education

*Optimized for 11x17 printing

Released 11/03/2022

Arizona Science Standards - 3rd Grade

Core Ideas for Knowing Science: Elements for Physical, Earth & Space, and Life Science Standards

Elements of Physical Science Standards

3.P2U1.1 Ask questions and investigate the relationship between light, objects, and the human eye.
- An object can be seen when light reflected from its surface enters the eyes; the color people see depends on the color of the available light sources as well as the properties of the surface.

Clarification Statement: This phenomenon is observed, but no attempt is made to discuss what confers the color reflection and absorption properties on a surface. The stress is on understanding that light traveling from the object to the eye determines what is seen.

3.P2U1.2 Plan and carry out an investigation to explore how sound waves affect objects at varying distances.
- Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks).
- Sound comes from things that vibrate and can be detected at a distance from the source because the air or other material around is made to vibrate. Sounds are heard when the vibrations in the air enter our ears.

3.P4U1.3 Develop and use models to describe how light and sound waves transfer energy.
- Energy can be moved from place to place by moving objects or through sound or light.

Boundary: At this grade level, no attempt is made to give a precise or complete definition of energy.

Elements of Earth and Space Science Standards

3.E1U1.4 Construct an explanation describing how the Sun is the primary source of energy impacting Earth systems.
- Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans).
- Radiation from the Sun heats the Earth's surface.
- Energy radiated from the Sun is transferred to earth by light. When this light is absorbed, it warms earth's land, air, and water and facilitates plant growth.

Elements of Life Science Standards

3.L1U1.5 Develop and use models to explain that plants and animals (including humans) have internal and external structures that serve various functions that aid in growth, survival, behavior, and reproduction.
- Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

3.L1U1.6 Plan and carry out investigations to demonstrate ways plants and animals react to stimuli.
- Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions.

3.L2U1.7 Develop and use system models to describe the flow of energy from the Sun to and among living organisms.
- The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants. Either way, they are "consumers."
- Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil for plants to use. (3.L2U1.8)
- Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.

3.L2U1.8 Construct an argument from evidence that organisms are interdependent.
- Animals need food that they can break down, which comes either directly by eating plants (herbivores) or by eating animals (carnivores) which have eaten plants or other animals.
- Animals are ultimately dependent on plants for their survival. The relationships among organisms can be represented as food chains and food webs. Some animals are dependent on plants in other ways as well as for food. Plants also depend on animals in various ways. (3.L2U1.8)

The elements are not to be used as a check-off list, but rather a useful tool to help educators identify the specific pieces of knowledge and skill that make up the practice, crosscutting concept, or core idea at that grade-band.

*Optimized for 11x17 printing

ARIZONA Department of Education

Released 11/03/2022
Updated 7/16/2024