Next Generation Science Standards Science

Grade 1

Adopted 2013

Waves and their Applications in Technologies for Information Transfer 1-PS4

Students who demonstrate understanding can:

1-PS4-1. Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. 1-PS4-1

1-PS4-2. Make observations to construct an evidence-based account that objects can be seen only when illuminated. 1-PS4-2

1-PS4-3. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. 1-PS4-3

1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. 1-PS4-4

From Molecules to Organisms: Structures and Processes 1-LS1

Students who demonstrate understanding can:

1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs. 1-LS1-1

1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. 1-LS1-2

Heredity: Inheritance and Variation of Traits 1-LS3

Students who demonstrate understanding can:

1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. 1-LS3-1

Earth's Place in the Universe 1-ESS1

Students who demonstrate understanding can:

1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns that can be predicted. 1-ESS1-1

1-ESS1-2. Make observations at different times of year to relate the amount of daylight to the time of year. 1-ESS1-2

Engineering Design K-2-ETS1

Students who demonstrate understanding can:

K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. K-2-ETS1-1

K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. K-2-ETS1-2

K-2-ETS1-3. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs. K-2-ETS1-3

Science and Engineering Practices SEP

1. **Analyzing and Interpreting Data** SEP.1

   K-2. Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. SEP.1.K-2

   - Analyze data from tests of an object or tool to determine if it works as intended. SEP.1.K-2.1
   - Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. SEP.1.K-2.2

2. **Asking Questions and Defining Problems** SEP.2

   K-2. Asking questions and defining problems in grades K–2 builds on prior experiences and progresses to simple descriptive questions that can be tested. SEP.2.K-2

   - Ask questions based on observations to find more information about the natural and/or designed world(s). SEP.2.K-2.2
   - Define a simple problem that can be solved through the development of a new or improved object or tool. SEP.2.K-2.3

3. **Constructing Explanations and Designing Solutions** SEP.3

   K-2. Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. SEP.3.K-2

   - Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. SEP.3.K-2.2
   - Use tools and materials provided to design a device that solves a specific problem. SEP.3.K-2.3
   - Use materials to design a device that solves a specific problem or a solution to a specific problem. SEP.3.K-2.4

6. Obtaining, Evaluating, and Communicating Information SEP.6

K-2. Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. SEP.6.K-2

- Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. SEP.6.K-2.3

7. Planning and Carrying Out Investigations SEP.7

K-2. Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. SEP.7.K-2

- Make observations (firsthand or from media) to collect data that can be used to make comparisons. SEP.7.K-2.2
- Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. SEP.7.K-2.3

8. Scientific Investigations Use a Variety of Methods SEP.8

- Scientists use different ways to study the world. SEP.8.1
- Science investigations begin with a question. SEP.8.2

Disciplinary Core Ideas DCI

A. Wave Properties DCI.PS4.A

- Sound can make matter vibrate, and vibrating matter can make sound. DCI.PS4.A.K-2.1

B. Electromagnetic Radiation DCI.PS4.B

- Objects can be seen if light is available to illuminate them or if they give off their own light. DCI.PS4.B.K-2.1
- Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) DCI.PS4.B.K-2.2

C. Information Technologies and Instrumentation DCI.PS4.C

- People also use a variety of devices to communicate (send and receive information) over long distances. DCI.PS4.C.K-2.1

A. Structure and Function DCI.LS1.A

- All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. DCI.LS1.A.K-2.1

B. Growth and Development of Organisms DCI.LS1.B

- Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. DCI.LS1.B.K-2.1

D. Information Processing DCI.LS1.D

- Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. DCI.LS1.D.K-2.1

A. Inheritance of Traits DCI.LS3.A

- Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. DCI.LS3.A.K-2.1

B. Variation of Traits DCI.LS3.B

- Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. DCI.LS3.B.K-2.1

A. The Universe and its Stars DCI.ESS1.A

- Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. DCI.ESS1.A.K-2.1

B. Earth and the Solar System DCI.ESS1.B

- Seasonal patterns of sunrise and sunset can be observed, described, and predicted. DCI.ESS1.B.K-2.1

A. Defining and Delimiting an Engineering Problem DCI.ETS1.A

- Asking questions, making observations, and gathering information are helpful in thinking about problems. DCI.ETS1.A.K-2.1
- A situation that people want to change or create can be approached as a problem to be solved through engineering. DCI.ETS1.A.K-2.2
- Before beginning to design a solution, it is important to clearly understand the problem. DCI.ETS1.A.K-2.3

C. Optimizing the Design Solution DCI.ETS1.C

- Because there is always more than one possible solution to a problem, it is useful to compare and test designs. DCI.ETS1.C.K-2.1

Crosscutting Concepts CCC

1. Patterns CCC.1

- Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. CCC.1.K-2.2

2. Cause and Effect CCC.2

- Simple tests can be designed to gather evidence to support or refute student ideas about causes. CCC.2.K-2.1

6. Structure and Function CCC.6

- The shape and stability of structures of natural and designed objects are related to their function(s). CCC.6.K-2.1

8. Influence of Engineering, Technology, and Science on Society and the Natural World CCC.8

- People depend on various technologies in their lives; human life would be very different without technology. CCC.8.K-2.1
- Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. CCC.8.K-2.2

11. Scientific Knowledge Assumes an Order and Consistency in Natural Systems CCC.11

- Science assumes natural events happen today as they happened in the past. CCC.11.K-2.1
- Many events are repeated. CCC.11.K-2.2