

Grade K Science and Technology

A. Unifying Themes: Students apply the principles of *systems*, *models*, constancy and change, and scale in science and technology

A1 Systems

Students recognize that parts work together, and make up whole man-made and natural objects.

- a. Explain that most man-made and natural objects are made of parts.
- b. Explain that when put together, parts can do things they could not do separately.

A2 Models

Students identify *models* and the objects they represent to learn about their features.

- a. Describe ways in which toys and pictures are like the real things they model.
- b. Use a *model* as a tool to describe the motion of objects or the features of plants and animals.

A3 Constancy and Change

Students observe that in the physical setting, the living environment, and the technological world some things change over time and some things stay the same.

- a. Describe the size, weight, color, or movement of things over varying lengths of time and note qualities that change or remain the same.

A4 Scale

Students observe differences in scale.

- a. Compare significantly different sizes, weights, ages, and speeds of objects.

B. The Skills and Traits of Scientific Inquiry and *Technological Design*: Students plan, conduct, analyze data from and communicate results of in-depth scientific investigations; and they use a systematic process, tools, equipment, and a variety of materials to create a *technological design* and produce a solution or product to meet a specified need.

B1 Skills and Traits of Scientific Inquiry

Students conduct and communicate results of simple investigations.

- a. Ask questions and make observations about objects, organisms, and events in the environment.
- b. Safely conduct simple investigations to answer questions.
- c. Use simple instruments with basic units of measurement to gather data and extend the senses.
- d. Know what constitutes evidence that can be used to construct a reasonable explanation.
- e. Use writing, speaking, and drawing to communicate investigations and explanations.

B2 Skills and Traits of *Technological Design*

Students use a simple design process and basic tools and materials to solve a problem or create a product.

- a. Describe a design problem in their own words.
- b. Propose a way to build something or cause something to work better.
- c. Use suitable tools, materials, safe techniques, and measurements to implement a proposed solution to a design problem.
- d. Judge how well a product or design solved a problem.
- e. Present a design or solution to a problem using oral, written, or pictorial means of communication.

C. The Scientific and Technological Enterprise: Students understand the history and nature of scientific knowledge and technology, the processes of inquiry and *technological design*, and the impacts science and technology have on society and the environment.

C1 Understandings of Inquiry

Students describe the use of questions and accurate communication in scientists' work.

- a. Describe how scientific investigations involve asking and answering a question.
- b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.

C2 Understandings About Science and Technology

Students recognize that people have always engaged in science and technology and that there is a difference between the natural and designed worlds.

- a. Recognize that people have always had problems and invented tools and ways of doing things to solve problems.
- b. Distinguish between objects that occur in nature and objects that are man-made.

C3 Science, Technology, and Society

No performance indicator.

Although no performance indicators are stated, students are expected to have instructional experiences that describe influences of science and technology on their own lives.

C. RESEARCH: Students engage in inquiry by developing research questions, accessing and verifying a variety of sources, communicating findings, and applying the conventions of documentation. Students present findings orally, in writing, or using mixed media.

C4 History and Nature of Science

No performance indicator.

Although no performance indicators are stated, students are expected to have instructional experiences that describe how people use science in their lives.

D. The Physical Setting: Students understand the universal nature of matter, energy, force, and motion and identify how these relationships are exhibited in Earth Systems, in the solar system, and throughout the universe.

D1 Universe and Solar System

Students describe the movement of objects across the sky, as seen from Earth.

- a. Describe how the sun and moon seem to move across the sky.
- b. Describe the changes in the appearance of the moon from day to day.

D2 Earth

Students describe Earth's weather and surface materials and the different ways they change.

- a. Explain that the sun warms the air, water, and land.
- b. Describe the way in which weather changes over months.
- c. Describe what happens to water left in an open container as compared to water left in a closed container.

D3 Matter and Energy

Students use observable characteristics to describe objects and materials and changes to physical properties of materials.

- a. Describe objects in terms of what they are made of and their physical properties.
- b. Describe changes in properties of materials when mixed, heated, frozen, or cut.

D4 Force and Motion

Students describe how objects move in different ways.

- a. Describe different ways things move and what it takes to start objects moving, keep objects moving, or stop objects.
- b. Give examples of things that make sound by vibrating.

E. The Living Environment: Students understand that cells are the basic unit of life, that all life as we know it has evolved through genetic transfer and natural selection to create a great diversity of organisms, and that these organisms create interdependent webs through which matter and energy flow. Students understand similarities and differences between humans and other organisms and the interconnections of these interdependent webs.

E1 Biodiversity

Students describe similarities and differences in the observable behaviors, features, and needs of plants and animals.

- a. Describe similarities and differences in the way plants and animals look and the things that they do.
- b. Describe some features of plants and animals that help them live in different environments.
- c. Describe how organisms change during their lifetime.

E2 Ecosystems

Students understand how plants and animals depend on each other and the environment in which they live.

- a. Explain that animals use plants and other animals for food, shelter, and nesting.
- b. Compare different animals and plants that live in different environments of the world.

E3 Cells

Students describe parts and wholes of living things, their basic needs, and the structures and processes that help them stay alive.

- a. List living things and their parts. Explain that parts of living are so small we can only see them using magnifiers.
- b. List the basic things that most organisms need to survive.

- c. Identify structures that help organisms do things to stay alive.

E4 Heredity and Reproduction

Students describe the cycle of birth, development, and death in different organisms and the ways in which organisms resemble their parents.

- a. Give examples of how organisms are like their parents and not like them.
- b. Describe the life cycle of a plant or animal (including being born, growing, reproducing, and dying).

E5 Evolution

Students describe similarities and differences between present day and past organisms that helped the organisms live in their environment.

- a. Describe some organisms' features that allow the organisms to live in places others cannot.
- b. Explain how some kinds of organisms that once lived on Earth have completely disappeared, although they were similar to some that are alive today.