

Prepared Graduates:

1. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding structure, properties and interactions of matter.

Grade Level Expectation:

1. Matter exists as different substances that have observable different properties.

Evidence Outcomes

Students Can:

- a. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. (2-PS1-1) *(Clarification Statement: Observations could include color, texture, hardness and flexibility. Patterns could include the similar properties that different materials share.)*
- b. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. (2-PS1-2) *(Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture and absorbency.) (Boundary Statement: Quantitative measurement is limited to length.)*
- c. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. (2-PS1-3) *(Clarification Statement: Examples of pieces could include blocks, building bricks or other assorted small objects.)*
- d. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. (2-PS1-4) *(Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf and heating paper.)*

Academic Context and Connections

Colorado Essential Skills and Science and Engineering Practices:

1. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question (Planning and Carrying Out Investigations) (Personal: Personal responsibility)
2. Analyze data from tests of an object or tool to determine if it works as intended (Analyzing and Interpreting Data) (Entrepreneurial: Critical thinking/Problem solving)
3. Make observations from several sources to construct an evidence-based account for natural phenomena (Constructing Explanations and Designing Solutions) (Entrepreneurial: Inquiry/Analysis)
4. Construct an argument with evidence to support a claim (Engaging in Argument from Evidence) (Personal: Initiative/Self-direction)
5. Connections to Nature of Science: Science Models, Laws, Mechanisms and Theories Explain Natural Phenomena: Science searches for cause - and - effect relationships to explain natural events.





Elaboration on the GLE:

1. Students can answer the question: How do particles combine to form the variety of matter one observes?
2. PS1:A Structure and Properties of Matter: Different kinds of matter exist (e.g., wood, metal, water), and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties (e.g., visual, aural, textural), by its uses and by whether it occurs naturally or is manufactured. Different properties are suited to different purposes. A great variety of objects can be built up from a small set of pieces (e.g., blocks, construction sets). Objects or samples of a substance can be weighed, and their size can be described and measured.
3. PS1:B Chemical Reactions: Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible (e.g., melting and freezing), and sometimes they are not (e.g., baking a cake, burning fuel).

Cross Cutting Concepts:

1. Patterns: Patterns in the natural and human - designed world can be observed.
2. Cause and Effect: Events have causes that generate observable patterns. Simple tests can be designed to gather evidence to support or refute student ideas about causes.
3. Energy and Matter: Objects may break into smaller pieces and be put together into larger pieces or may change shapes.
4. Connections to Engineering, Technology and Applications of Science: Influence of Science, Engineering and Technology on Society & the Natural World. Every human-made product is designed.





Prepared Graduates:

6. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how living systems interact with the biotic and abiotic environment.

Grade Level Expectation:

1. Plants depend on water and light to grow and on animals for pollination or to move their seeds around.

Evidence Outcomes

Students Can:

- a. Plan and conduct an investigation to determine if plants need sunlight and water to grow. (2-LS2-1) (*Boundary Statement: Limited to using one variable at a time.*)
- b. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. (2-LS2-2)

Academic Context and Connections

Colorado Essential Skills and Science and Engineering Practices:

1. Develop a simple model based on evidence to represent a proposed object or tool (Developing and Using Models) (Personal: Initiative/Self-direction)
2. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question (Planning and Carrying Out Investigations) (Civic/Interpersonal: Collaboration/Teamwork)
3. Connections to Nature of Science: Science Knowledge is Based on Empirical Evidence

Elaboration on the GLE:

1. Students can answer the question: How do organisms interact with the living and nonliving environments to obtain matter and energy?
2. LS2:A Interdependent Relationships in Ecosystems: Animals depend on their surroundings to get what they need, including food, water, shelter and a favorable temperature. Animals depend on plants or other animals for food. They use their senses to find food and water, and they use their body parts to gather, catch, eat and chew the food. Plants depend on air, water, minerals (in the soil) and light to grow. Animals can move around, but plants cannot, and they often depend on animals for pollination or to move their seeds around. Different plants survive better in different settings because they have varied needs for water, minerals and sunlight.

Cross Cutting Concepts:

1. Cause and Effect: Events have causes that generate observable patterns.
2. Structure and Function: The shape and stability of structures of natural and designed objects are related to their function(s).

Prepared Graduates:

8. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how natural selection drives biological evolution accounting for the unity and diversity of organisms.

Grade Level Expectation:

2. A range of different organisms lives in different places.

Evidence Outcomes

Students Can:

- a. Make observations of plants and animals to compare the diversity of life in different habitats. (2-LS4-1) (*Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.*)

Academic Context and Connections

Colorado Essential Skills and Science and Engineering Practices:

1. Make observations to collect data that can be used to make comparisons. (Planning and Carrying Out Investigations) (Entrepreneurial: Creativity and Innovation)
2. Connections to Nature of Science: Science Knowledge is Based on Empirical Evidence

Elaboration on the GLE:

1. Students can answer the question: What evidence shows that different species are related?
2. LS4:D Biodiversity and Humans: There are many different kinds of living things in any area, and they exist in different places on land and in water.



Prepared Graduates:

9. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding the universe and Earth’s place in it.

Grade Level Expectation:

1. Some events on Earth occur quickly; others can occur very slowly.

Evidence Outcomes

Students Can:

- a. Use information from several sources to provide evidence that Earth events can occur quickly or slowly. (2-ESS1-1) (*Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly, and erosion of rocks, which occurs slowly.*)

Academic Context and Connections

Colorado Essential Skills and Science and Engineering Practices:

1. Make observations from several sources to construct an evidence-based account for natural phenomena. (Constructing Explanations and Designing Solutions) (Entrepreneurial: Critical thinking/Problem solving)

Elaboration on the GLE:

1. Students can answer the question: How do people reconstruct and date events in the Earth’s planetary history?
2. ESS1:C The History of Planet Earth: Some events on Earth occur in cycles, like day and night, and others have a beginning and an end, like a volcanic eruption. Some events, like an earthquake, happen very quickly; others, such as the formation of the Grand Canyon, occur very slowly over a time period much longer than one can observe.

Cross Cutting Concepts:

1. Stability and Change: Things may change rapidly or slowly.

Prepared Graduates:

10. Students can use the full range of science and engineering practices to make sense of natural phenomena and solve problems that require understanding how and why Earth is constantly changing.

Grade Level Expectation:

2. Wind and water can change the shape of the land; models can show the shape and these changes to the land.

Evidence Outcomes

Students Can:

- Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. (2-ESS2-1) (*Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.*)
- Develop a model to represent the shapes and kinds of land and bodies of water in an area. (2-ESS2-2) (*Boundary Statement: Does not include quantitative scaling in models.*)
- Obtain information to identify where water is found on Earth and that it can be solid or liquid. (ESS2-3)

Academic Context and Connections

Colorado Essential Skills and Science and Engineering Practices:

- Compare multiple solutions to a problem. (Constructing Explanations and Designing Solutions) (Entrepreneurial: Inquiry/Analysis)
- Develop a model to represent patterns in the natural world. (Developing and Using Models) (Personal: Initiative/Self-direction)
- Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (Obtaining, Evaluating, and Communicating Information) (Civic/Interpersonal: Communication)

Elaboration on the GLE:

- Students can answer the question: How and why is Earth constantly changing?
- ESS2:A Earth Materials and Systems: Wind and water can change the shape of the land. The resulting landforms, together with the materials on the land, provide homes for living things.
- ESS2:B Plate Tectonics and Large-Scale System Interactions: Rocks, soils, and sand are present in most areas where plants and animals live. There may also be rivers, streams, lakes and ponds. Maps show where things are located. One can map the shapes and kinds of land and water in any area.
- ESS2:C The Roles of Water in Earth's Surface Processes: Water is found in the ocean, rivers, lakes and ponds. Water exists as solid ice and in liquid form. It carries soil and rocks from one place to another and determines the variety of life forms that can live in a particular location.

Cross Cutting Concepts:

- Patterns: Patterns in the natural world can be observed.
- Stability and Change: Things may change slowly or rapidly.
- Influence of Science, Engineering and Technology on Society and the Natural World: Developing and using technology has impacts on the natural world.
- Connections to Nature of Science: Science Addresses Questions About the Natural and Material World. Scientists study the natural and material world.