

Standards Covered by Georgia Geology and Gems Field Trip  
2017 Georgia Standards of Excellence

## Science

### Kindergarten

SKE2: Obtain, evaluate and communicate information to describe the physical attributes of earth materials (soil, rocks, water and air)

- a) Ask questions to identify and describe Earth materials – soil, rocks, water and air
- b) Construct an argument supported by evidence for how rocks can be grouped by physical attributes (size, weight, texture, color)
- c) Use tools to observe and record physical attributes of soil as texture and color

SKP1: Obtain, evaluate and communicate information to describe objects in terms of the material they are made of and their physical attributes

- a) Ask questions to compare and sort objects made of different materials
- b) Use senses and science to classify common objects according to their physical attributes (color, size, shape, weight and texture)
- c) Plan and carry out an investigation to predict and observe whether objects, based on their physical attributes will sink or float

### Second Grade

S2E3: Obtain, evaluate, and communicate information about how weather, plants, animals, and humans cause changes to the environment. (**primary observation – erosion**)

- a) Ask questions to obtain information about major changes to the environment in your community
- b) Construct an explanation of the causes and effects of a change in the environment in your community

S2P1 Obtain, evaluate and communicate information about the properties of matter and changes that occur in objects.

- a) Ask questions to describe and classify different objects according to their physical properties (clarification statement) Examples of physical properties could include color, mass, length, texture, hardness, strength, absorbency, and flexibility)
- b) N/A
- c) Provide evidence from observations to construct an explanation that some changes in matter caused by heating or cooling can be reversed and some changes are irreversible. (**Volcanic Rock**)

### Third Grade

S3E1 Obtain, evaluate and communicate information about the physical attributes of rocks and soils.

- a) Ask questions and analyze data to classify rocks by their physical attributes (color, texture, luster, and hardness) using simple tests (clarification statement: Moh's hardness scale should be used at this level – cleavage, streak and the classification of rocks as sedimentary, igneous and metamorphic are studied in 6<sup>th</sup> grade)
- b) Plan and carry out investigations to describe properties (color, texture, capacity to retain water, and ability to support growth of plants) of soils and soil types (sand, clay, loam)
- c) Make observations of the local environment to construct an explanation of how water and/or wind have made changes to soil and/ or rocks over time – erosion

- S3E2 Obtain, evaluate, and communicate information on how fossils provide evidence of past organisms
- Construct an argument from observations of fossils to communicate how they serve as evidence of past organisms and the environments in which they lived
  - Develop a model to describe the sequence and conditions required for an organism to become fossilized (Clarification statement: Types of fossils (cast, mold, trace, and true) are not addressed in this standard)

### **Fifth Grade**

S5E1 Obtain, evaluate, and communicate information to identify surface features on the Earth caused by constructive and/ or destructive processes.

- Construct an argument supported by scientific evidence to identify surface features (examples: deltas, dunes and volcanoes) as being caused by constructive or destructive processes (examples: could include deposition, weathering, erosion, and impact of organism)
- N/A
- Ask questions to obtain information on how technology is used to limit and / or predict the impact of constructive or destructive processes  
(clarification statement: Examples could include – seismological studies, flood forecasting (GIS maps), engineering/ construction methods and materials, and infrared/ satellite imagery)

### **Sixth Grade**

S6E5. Students will investigate the scientific view of how the earth's surface is formed.

- Compare and contrast the Earth's crust, mantle, and core including temperature, density, and composition.
- Investigate the contribution of minerals to rock composition.
- Classify rocks by their process of formation.
- Describe processes that change rocks and the surface of the earth.
- Recognize that lithospheric plates constantly move and cause major geological events on the earth's surface.
- Explain the effects of physical processes (plate tectonics, erosion, deposition, volcanic eruption, gravity) on geological features including oceans (composition, currents, and tides).
- Describe how fossils show evidence of the changing surface and climate of the Earth.
- S6E5. Students will investigate the scientific view of how the earth's surface is formed. a. Compare and contrast the Earth's crust, mantle, and core including temperature, density, and composition. b. Investigate the contribution of minerals to rock composition. c. Classify rocks by their process of formation. d. Describe processes that change rocks and the surface of the earth. e. Recognize that lithospheric plates constantly move and cause major geological events on the earth's surface. f. Explain the effects of physical processes (plate tectonics, erosion, deposition, volcanic eruption, gravity) on geological features including oceans (composition, currents, and tides). g. Describe how fossils show evidence of the changing surface and climate of the Earth. h. Describe soil as consisting of weathered rocks and decomposed organic material. i. Explain the effects of human activity on the erosion of the earth's surface Describe soil as consisting of weathered rocks and decomposed organic material.
- Explain the effects of human activity on the erosion of the earth's surface

## **High School 9-12**

SES2 Obtain, evaluate, and communicate information to understand how plate tectonics creates certain geologic features, landforms, Earth materials and geologic hazards.

- a) Construct an explanation based on evidence that describes the mechanisms causing plate tectonic motion. (Clarification statement: The role of radioactive decay as the source of energy that drives the process of convection should be studied as part of this element).
- b) Develop and use models for the different types of plate tectonic settings (convergent, divergent and transform boundaries). (Clarification statement: Subduction zones, continental collisions, rift zones, and ocean basins should be included.)
- c) Construct an explanation that communicates the relationship of geologic features, landforms, Earth materials and geologic hazards to each plate tectonic setting.
- d) Ask questions to compare and contrast the relationship between transformation processes of all rock types (sedimentary, igneous, and metamorphic) and specific plate tectonic settings. (Clarification statement: The plate tectonic settings to be considered here are continental collision, subduction zone, mid-ocean ridge, transformation fault, hot spot, and passive zone.)
- e) Construct an argument using multiple forms of evidence that supports the theory of plate tectonics (e.g., fossils, paleomagnetism, seafloor age, etc.).

SES3. Obtain, evaluate, and communicate information to explore the actions of water, wind, ice, and gravity as they relate to landscape change.

- a) Plan and carry out an investigation that demonstrates how surface water and groundwater act as the major agents of physical and chemical weathering.
- b) Develop a model of the processes and geologic hazards that result from both sudden and gradual mass wasting. Science Georgia Standards of Excellence Georgia Department of Education March 31, 2016 • Page 3 of 4
- c) Construct an explanation that relates the past and present actions of ice, wind, and water to landform distribution and landscape change.
- d) Construct an argument based on evidence that relates the characteristics of the sedimentary materials to the energy by which they were transported and deposited.

SES4. Obtain, evaluate, and communicate information to understand how rock relationships and fossils are used to reconstruct the Earth's past.

- a) Use mathematics and computational thinking to calculate the absolute age of rocks using a variety of methods (e.g., radiometric dating, rates of erosion, rates of deposition, and varve count).
- b) Construct an argument applying principles of relative age (superposition, original horizontality, cross-cutting relations, and original lateral continuity) to interpret a geologic cross-section and describe how unconformities form.
- c) Analyze and interpret data from rock and fossil succession in a rock sequence to interpret major events in Earth's history such as mass extinction, major climatic change, and tectonic events.
- d) Construct an explanation applying the principle of uniformitarianism to show the relationship between sedimentary rocks and their fossils to the environments in which they were formed.
- e) Construct an argument using spatial representations of Earth data that interprets major transitions in Earth's history from the fossil and rock record of geologically defined areas. (Clarification statement: Students should use maps and cross-sections with a focus on Georgia.)