MP1a-Earth's Changing Surface

Content Area: **Science**
Course(s): **Science 4**
Time Period: **Marking Period 1**
Length: **MP 1**
Status: **Published**

Essential Questions

- What are tectonic plates and what causes many of Earth's surface features?
- What is chemical weathering and erosion and how do they affect the environment?
- How does rainfall affect the environment?

Big Ideas

- Earth's physical features occur in patterns, as do earthquakes and volcanos. Maps can be used to locate features and determine patterns in those events.
- Rainfall helps to shape the land and affects the types of living things found in a region.
- Water, ice, wind, organisms, and gravity break rocks, soils and sediments into smaller pieces and move them around.

CRLLKS- Career Education

9.2.5CAP1-Evaluate personal likes and dislikes and identify careers that might be suited to personal likes

9.2.5CAP2- Identify how you might like to earn an income

Connection:

Introduce the description of a geologist's career and the different roles they play in society. Discuss the importance of this career.

Cross-Curricular Integration

Integration Area: ELA

W.WR.4.5. Conduct short research projects that use multiple reference sources (print and non-print) and build knowledge through investigation of different aspects of a topic.

W.SE.4.6. Gather relevant information from multiple print and digital sources; take notes, prioritize and categorize.

Activity:

Students will research a National Park and work collaboratively to create a slideshow with information about its location, rock formations, and additional information

Science and Engineering Practices

Developing and Using Models:

- Develop and/or use models to describe and/or predict phenomena

STEM/STEAM

PROBLEM-BASED LEARNING: Students will design earthquake resistant structures

EDI: Compare how the same problem is addressed in different areas around the world (areas located along the "Ring of Fire" such as California and Indonesia). What resources or limitations of resources affect this?

CSDT Technology Integration

8.1.5DA.3 Organize and present collected data visually to communicate insights gained from different views of the data.

Activity:

Students will complete an organizer where they research one National Park to find the types of rock there and how landforms were made. Students will work in groups to use their organizers to create a Google Slideshow about their National Park. (Multiple students will have the same National Park, and they can compare notes.) When finished, students will present their slideshows to the class.

Enduring Understandings

Plate Tectonics and Large-Scale System Interactions

4-ESS2.B The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features of Earth.

Earth Materials and Systems

4-ESS2.A Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.

Focus Areas

Knowledge

- The layer of Earth that tells us the most about Earth's history is the crust.
- Earth's crust is made up of tectonic plates that float on the mantle and interact at their boundaries.
- Many of the features on Earth's surface exist at tectonic plate boundaries.
- Weathering is the break down or dissolving of rocks on Earth's surface.
- Chemical weathering is when chemicals change the materials that make up a rock.
- Erosion is the movement of broken down rocks.
- Rainfall impacts what an environment is like and what organisms live there.

Skills

- Create a model of sedimentary rock formation.
- Identify rock layers in a sedimentary rock model and use this information to determine the step- by-step process of rock formation.
- Collaborate to build a model of one type of plate boundary.
- Map earthquakes and plate boundary locations and determine the connections between their locations.
- Create a model of ice weathering a rock and relate it to weathering in nature.
- Create a model of water weathering a rock and relate it to weathering in nature.
- Create a model of erosion and relate it to erosion in nature.
- Create a model of weathering and erosion and relate it to weathering and erosion in nature.
- Identify chemical versus physical weathering.
- Distinguish between weathering and erosion.
- Identify the effects of weathering and erosion in the environment around their school.

Understanding

- Analyze and interpret data from maps to describe patterns of Earth's features.
- Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

Resources

Primary Resource

Pearson Interactive Science, 2016

- Chapter 6: Earth's Resources

Secondary Resources

Pearson Leveled Readers

- *Earth's Resources*
- *Types of Rocks and Minerals*
- *Mining for Rocks and Minerals*

Scientific Inquiry

Core

- Mineral Lab
- Sediment Rate of Deposition Lab
- Rock Layers Lab
- Plate Tectonics Lab
- Chemical Weathering Lab
- Glacial Weathering and Erosion Lab