**Geology Unit Organizer**

**4th Grade Siener/Ronen/Hersh**

**Summary**

In this domain, students will add to their knowledge of the Earth and what it’s made of. Through slideshows and read-alouds, students will learn the theory of plate tectonics and how the movement of the earth affects things such as the placement of the continents, and natural phenomena such as earthquakes, faults, tsunamis, and volcanoes. Students will also learn how mountains are formed, what the different types of rocks are, and how weathering and erosion break down and move rocks. Finally, they will learn about the formation of soil.

**The Big Idea**

Earth is composed of layers that, through heat and pressure, cause movements that result in geological features above and below the surface.

**Colorado State Standards**

**SS.6.3.1.a:** Gather, analyze, and communicate an evidence-based explanation for the complex interaction between Earth’s constructive and destructive forces.

**SS.5.3.2.a:** Analyze and interpret data identifying ways Earth’s surface is constantly changing through a variety of processes and forces such as plate tectonics, erosion, deposition, solar influences, climate, and human activity

**SS.7.3.1.c:** Use maps to locate likely geologic “hot spots”, using evidence of earthquakes and volcanic activity

**SS.5.3.2.a:** Analyze and interpret data identifying ways Earth’s surface is constantly changing through a variety of processes and forces such as plate tectonics, erosion, deposition, solar influences, climate, and human activity

**SS.7.3.1.b:** Identify, interpret, and explain models of plates motions on Earth

**SS.7.3.1.a:** Gather, analyze, and communicate data that explains Earth’s plates, plate motions, and the results of plate motions

**SS.3.3.1.c:** Utilize a variety of media sources to collect and analyze data around Earth’s materials and the processes by which they are formed

**SS.3.3.1.b:** Use evidence to develop a scientific explanation about one or more process that break down and/or combine Earth’s materials

**SS.3.3.1.a:** Investigate and identify two or more ways that Earth’s materials can be broken down and/or combined in different ways such as minerals into rocks, rock cycle, formation of soil, and sand

**Common Core State Standards**

**W4.4** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.

**W4.5** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.

**W4.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

**a.** Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

**b.** Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.

**c.** Link ideas within categories of information using words and phrases (e.g., another, for example, also, because).

**d.** Use precise language and domain-specific vocabulary to inform about or explain the topic.

**e.** Provide a concluding statement or section related to the information or explanation presented.

**L4.2** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

**a.** Use correct capitalization.

**b.** Use commas and quotation marks to mark direct speech and quotations from a text.

**c.** Use a comma before a coordinating conjunction in a compound sentence.

**d.** Spell grade-appropriate words correctly, consulting references as needed.

**Core Knowledge Content**

A. The Earth’s Layers

-Crust, mantle, core (outer core and inner core)

-Movement of crustal plates

-Earthquakes Faults, San Andreas fault –Measuring intensity: seismograph and Richter scale

-Tsunamis

-Volcanoes:

Magma

Lava and lava flow

Active, dormant, or extinct

Famous volcanoes: Vesuvius, Krakatoa, Mount St. Helens

-Hot springs and geysers: Old Faithful (in Yellowstone National Park)

-Theories of how the continents and oceans were formed: Pangaea and continental drift

B. How Mountains Are Formed

- Volcanic mountains, folded mountains, fault-block mountains,

dome-shaped mountains

-Undersea mountain peaks and trenches (Mariana Trench)

C. Rocks

-Formation and characteristics of metamorphic, igneous, and sedimentary rock

D. Weathering and Erosion

-Physical and chemical weathering

- Weathering and erosion by water, wind, and glaciers

- The formation of soil: topsoil, subsoil, bedrock

**Core Knowledge Language Arts**

1. Writing, Grammar, and Usage
2. Writing and Research

* Produce a variety of types of writing with a coherent structure or story line.
* Organize materials in paragraphs and understand:
  + - 1. How to use a topic sentence
      2. How to develop a paragraph with examples and details
      3. That each new paragraph is indented

1. Grammar and Usage

* Understand what a complete sentence is
* Know how to use the following punctuation:
  + - 1. End punctuation: period, question mark, or exclamation point
      2. Comma
      3. Apostrophe
      4. Quotation marks

**Previous Unit:** None

**Prior Knowledge**

Grade 1

* Earth
  + Geographical features of Earth’s surface, including the shape of the Earth and the horizon
  + Oceans and continents
  + North and South Poles and Equator
  + What’s inside Earth, including the layers of Earth, volcanoes and geysers, and rocks and minerals

**Next Unit**: Chemistry

**What Students will Learn in Future Grades**

Grade 6

* Students will review and extend their learning about geology when they learn about plate tectonics.

**Cross Curricular Links**

Mathematics

VI. Geometry

* + Identify and draw lines: horizontal, vertical; perpendicular; parallel; intersecting

**Additional Resources**

*For Teachers:*

* + The National Geographic Society, [www.nationalgeographic.com](http://www.nationalgeographic.com)
  + The Mount St. Helens National Volcanic Monument Photo Gallery, [www.fs.fed.us/gpnf/mshnvm/digital-gallery/index.html](http://www.fs.fed.us/gpnf/mshnvm/digital-gallery/index.html)
  + A Webcam of Old Faithful, [www.nps.gov/yell/oldfaithfulcam.htm](http://www.nps.gov/yell/oldfaithfulcam.htm)

*For Children:*

* + *Earthquakes and Volcanoes*, by Lin Sutherland
  + *Rocks and Minerals*, by Jack Challoner
  + *Rocks and Minerals,* by Steven Parker
  + *Rocks and Minerals (Eyewitness Books),* by R. F. Symes
  + *Volcanoes,* by Seymour Simon