

Lesson Topic: Unit 3 Part 2: Earth's Systems/History of Earth

Grade level: 6

Length of lesson: 10 days (50 minute periods - *Note*this does not include presentation time*)

Content Standards

MS-ESS2-1: Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distribution of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

Big Ideas:

Students will understand:

- All Earth processes are the result of energy flowing and matter cycling within and among Earth's systems.
- Natural processes change Earth's crust over time.

Essential Question(s):

- What forces shape Earth's surface?
- How do these forces change Earth's surface over time?
- How do materials in and on Earth's crust change over time?

Student objectives (outcomes):

Students will be able to:

- Demonstrate understanding of the rock cycle.
- Explain why natural resources are unevenly distributed on Earth.

Assessment Evidence

Performance Task(s):

Landform Project/Presentations
Note to curriculum developers:
choose 3 for students to be informed on.

Other Evidence:

- Science Journal Notes

See Landform Research template in District Shared Folder: Middle School Science: 6th grade

Rock Cycle Activity

Make a simple drawing of the rock cycle. Label it so that all the stages are clear. Give one example of each kind of rock that is present in the cycle.

(2002 Harcourt Science Text grade 6

pg. D73) or search inter-net for similar activities.

Learning Plan

Learning Activities:

- Teaching vocabulary concepts: melting, crystallization, extrusive rock, intrusive rock, weathering, erosion, run-off, deformation, sedimentation, rock cycle, igneous, sedimentary, metamorphic, minerals, rocks, deposition, lithification, uplift, mass movement (landslides, creep, slump)
- Rock Cycle Lab, Games, Simulations
- Classifying Rocks by
 - Type
 - Extension Activities
 - Igneous (Intrusive and Extrusive)
- Weathering and Erosion Labs, Games, Simulations
- Landform Research
 - Mountains: Fold, Fault-Block, Volcanic, Dome (Shield), Plateau (plates and weathering/erosion)
 - Volcanoes: Shield, Lava Dome, Cinder Cone, Strata (plates)
 - Delta (deposition)
 - Canyon (weathering and erosion)
 - Cavern (weathering and deposition)
 - Dunes (weathering and erosion)
 - Glacial formations (weathering, erosion, and deposition)
 - Rivers and river valleys ((weathering, erosion, and deposition)
- Research questions should address:
 - What are the effects of weathering, erosion, deposition, and/or tectonic forces on the creation of these landforms?
 - How is the rock cycle illustrated in this landform?

- o How has the landform changed over time and what landforms could it transform into next?

Resources:

Discovery Ed

Delta Science Kits

Harcourt Science (Old Adoption)

<http://www.ck12.org/earth-science/Lithification-of-Sedimentary-Rocks/>

http://www.ck12.org/earth-science/Sedimentary-Rocks/studyguide/Sedimentary-Rocks-Study-Guide/?referrer=concept_details

Students who demonstrate understanding can:

MS-ESS2-1. *Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. [Clarification Statement: Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the cycling of Earth's materials.] [Assessment Boundary: Assessment does not include the identification and naming of minerals.]*

MS-ESS3-1 *Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. [Clarification Statement: Emphasis is on how these resources are limited and typically non-renewable, and how their distributions are significantly changing as a result of removal by humans. Examples of uneven distributions of resources as a result of past processes include but are not limited to petroleum (locations of the burial of organic marine sediments and subsequent geologic traps), metal ores (locations of past volcanic and hydrothermal activity associated with subduction zones), and soil (locations of active weathering and/or deposition of rock).]*

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. Develop and use a model to describe phenomena. (MS-ESS2-1)</p> <p>Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-ESS3-1)</p>	<p>ESS1.C: The History of Planet Earth</p> <ul style="list-style-type: none"> Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (HS.ESS1.C GBE), (secondary to MS-ESS2-3) <p>ESS2.A: Earth's Materials and Systems All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (MS-ESS2-1)</p> <p>ESS3.A: Natural Resources Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)</p>	<p>Stability and Change Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (MS-ESS2-1)</p> <p>Cause and Effect Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-ESS3-1)</p> <p>Connections to Engineering, Technology, and Applications of Science</p> <p>Influence of Science, Engineering, and Technology on Society and the Natural World All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1)</p>

Common Core State Standards Connections:

ELA/Literacy -
WHST.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ESS2-5)

Mathematics –
6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS3-1)

