



6th Grade - Science - Unit 1: Landforms

Unit: Science , Grade(s) 6

Earth Science - Landforms

Duration: 9 Weeks

Unit

Scope and Sequence

Earth Science

Topic: Landforms

Duration: 9-10 Weeks

Performance Objectives

SWBAT:

- analyze models of Earth's various landforms (e.g., mountains, peninsulas) IOT identify and describe these landforms.
- compare and contrast different bodies of water on Earth (e.g., streams, ponds, lakes, creeks) IOT categorize water systems as lentic or lotic.
- compare and contrast different water systems (e.g., wetlands, oceans, rivers, watersheds) IOT describe their relationship to each other as well as to landforms.
- create a stream table IOT explore relationships between systems, water, and land.
- identify features of maps and diagrams IOT interpret what models represent.
- describe Earth's natural processes IOT analyze their effects on the Earth's systems.
- give examples of weathering and erosion IOT describe the impacts of weathering and erosion on landforms.
- construct a scientific explanation based on evidence IOT determine how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- construct an explanation based on evidence IOT determine how geoscience processes have changed Earth's surface at varying time and spatial scales.
- define the criteria and constraints of a design problem IOT provide sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Key Terms and Definitions

model: A representation of an object or process.

key: An explanation of symbols used on a map.

map: A representation, usually on a flat surface, of an area or the features of an area.

erosion: The breakdown and removal of soil and rock by water, wind, or other forces.

deposition: The process by which eroded earth materials settle out in another place.

landform: A shape or feature of the Earth's surface, like a delta or canyon.

slope: The angle or slant of a stream channel or land surface.

flood: A very heavy flow of water, which is greater than the normal flow of water and goes over the stream's normal channel.



topographic map: A map that uses contour lines to show the shape and elevation of the land.

elevation: Vertical distance or height above sea level.

contour line: A line on a topographic map that connects points of equal elevation.

profile: A side view or cross-section of a landform such as a mountain.

sea level: The average height of the ocean's surface, zero elevation.

interpret: To figure out the symbols, textures, colors, and patterns to put together an image of the land covered by a map.

valley: A low area between higher areas through which a river or stream often flows.

ridge: A narrow area of high land between two valleys.

scale: A ratio, fraction, or graphic ruler that shows the relationship between size on a map and size in the real world.

weathering: the natural process by which atmospheric and environmental agents, such as wind, rain, and temperature changes, disintegrate and decompose rocks

landform: a physical feature of Earth's surface

mountain range: a series of mountains that are closely related in orientation, age, and mode of formation

watershed: the area of land that is drained by a river system

peninsula: a piece of land almost surrounded by water or projecting out into a body of water.

river system: a flowing network of rivers and streams draining a river basin

lake: a large body of water surrounded by land

bay: a broad inlet of the sea where the land curves inward

pond: a small body of still water formed naturally or by hollowing or embanking

stream: a small, narrow river

landslide: the sudden movement of rock and soil down a slope

volcano: a vent or fissure in the earth's surface through which magma and gases are expelled

earthquake: a movement or trembling of the ground that is caused by a sudden release of energy when rocks along a fault move

delta: a fan-shaped mass of rock material deposited at the mouth of a stream; for example, deltas form where streams flow into the ocean at the edge of a continent

deposition: the process in which material is laid down

sediment: fragments of organic or inorganic material that are transported and deposited by wind, water, or ice and that accumulate in layers on the earth's surface

lentic: inhabiting or situated in still, fresh water

lotic: inhabiting or situated in rapidly moving fresh water



constructive forces: processes that help build up the Earth, either by depositing soil or silt in a river, or by volcanoes and lava flows that generates new land

destructive forces: processes that break down the Earth, either through the violent actions of volcanoes and earthquakes or by the steady flow of a river

Essential Questions

How does Earth's surface change?
How do changes on Earth's surface impact humans?
How can maps help us understand the Earth?
How can water change the Earth's surface?
How can models represent Earth processes?
How does slope affect the flow of water?
How does the amount of water affect erosion and deposition?

Starting Points

The middle school topics and objectives begin to build on basic ideas and skills learned in elementary school so that students can explain more in-depth phenomena central to Earth Science. Regarding the landforms unit in particular, in elementary school students should have learned about the basic landforms as well as the main ways that water and land interaction, such as erosion and deposition. Students should also have an understanding of the water cycle as well as how human activity impacts land and water.

For this unit, students will formulate answers to the questions: "How do the materials in and on Earth's crust change over time?" and "How does water influence weather, circulate in the oceans, and shape Earth's surface?" Students will understand how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems.

Of special importance in both topics are the ways that geoscience processes provide resources needed by society but also cause natural hazards that present risks to society; both involve technological challenges, for the identification and development of resources and for the mitigation of hazards. The crosscutting concepts of cause and effect, energy and matter, and stability and change are called out as organizing concepts for these disciplinary core ideas

Instructional Resources

Unit Assessment Questions

[Click here](#) for assessment questions aligned to each objective in this unit. Use these questions as planning tools, formative assessment items, exit slip questions, or unit test questions.

Access to Online FOSS Landform Materials

<http://www.fossweb.com>(register as a user within The SDP)

Comprehensive list of vocabulary for FOSS Landforms

<http://archive.fossweb.com/modules3-6/Landforms/vocab.html>

Philadelphia Math and Science Partnership Resources

<http://www.fi.edu/msp/>

CK12 PLIX Interactives for Earth Science

<http://interactives.ck12.org/plix/index.html?subject=earth-science&referrer=browse&backUrl=http://www.ck12.org/earth-science/>

CK12 Resources - Search terms that relate to the unit

<https://www.ck12.org/earth-science/Maps/>

https://www.ck12.org/earth-science/Scientific-Models/lesson/Scientific-Models/?referrer=featured_content

<https://www.ck12.org/earth-science/Topographic-and-Geologic-Maps/>

<https://www.ck12.org/earth-science/Landforms-from-Stream-Erosion-and-Deposition/>



<https://www.ck12.org/earth-science/Erosion-and-Deposition/>

<https://www.ck12.org/earth-science/Influences-on-Weathering/>

<https://www.ck12.org/earth-science/Flooding/>

<https://www.ck12.org/earth-science/Landforms-from-Stream-Erosion-and-Deposition/>

<https://www.ck12.org/earth-science/Erosion-by-Streams/>

<https://www.ck12.org/earth-science/Deposition-by-Streams/>

<https://www.ck12.org/earth-science/Elevation-on-the-Earth/>

Visualizing Topography Interactive

<http://www.teachersdomain.org/resource/ess05.sci.ess.earthsys.vistopo/>

Erosion and Weathering Interactive

<http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.erosion/erosion-and-weathering/>

Example Videos of Teacher and Student Created Work on YouTube

https://www.youtube.com/results?search_query=FOSS+landforms

Example Resources Available in SAS by searching 6-8 band with keywords here:

<http://www.pdesas.org/module/content/search/>

Contour Map Activity from SAS using Contour Maps with DOGSTAILS

<http://www.pdesas.org/module/content/resources/16677/view.ashx>

Using Topography to Identify a Watershed Address from SAS

<http://www.pdesas.org/module/content/resources/7503/view.ashx>

Quizlet Search for FOSS Landforms

<https://quizlet.com/subject/foss-science-landforms/>

BrainPop Educator Lesson Ideas for Weathering & Erosion

<http://www.brainpopjr.com/science/land/slowlandchanges/grownups.weml>

Boulder Valley School District Unit Plan

<https://bvsvd.org/curriculum/science/Landforms/Landforms%20Binder.pdf>

LearningScience.org Earth Science Resources

<http://learningscience.org/esc2astructureearthsystem.htm>

Glenn Clinton Landforms Page

<http://lessons.ctaponline.org/~gclinton/>

Van Allen Science Teaching Center Landforms Resource Page

<http://www.aea10.k12.ia.us/vastscience/toolkits/landforms/unit.html>

Funded Donorschoose Project Example

<http://www.donorschoose.org/project/hands-on-science-with-foss-landforms-kit/32491/>

Earth Science Gizmos

<http://www.explorelearning.com/index.cfm?method=cResource.dspResourcesForCourse&CourseID=297>

Earth Science BrainPop

<https://www.brainpop.com/science/earthsystem/>

Links of Links



<http://cffscience.wikispaces.com>

<http://qzabteachers.wikispaces.com>

Eligible Content

- S4.A.3.2.1: Identify what different models represent (e.g., maps show physical features, directions, distances; globes represent Earth; drawings of watersheds depict terrain; dioramas show ecosystems; concept maps show relationships of ideas).
- S4.A.3.2.3: Use appropriate, simple modeling tools and techniques to describe or illustrate a system (e.g., two cans and string to model a communications system, terrarium to model an ecosystem).
- S4.D.1.1.2: Identify various Earth structures (e.g., mountains, watersheds, peninsulas, lakes, rivers, valleys) through the use of models.
- S4.D.1.3.3: Describe or compare lentic systems (i.e., ponds, lakes, and bays) and lotic systems (i.e., streams, creeks, and rivers).
- S8.A.1.1.4: Develop descriptions, explanations, predictions, and models using evidence.
- S8.A.2.1.5: Use evidence from investigations to clearly communicate and support conclusions.
- S8.A.2.2.1: Describe the appropriate use of instruments and scales to accurately and safely measure time, mass, distance, volume, or temperature under a variety of conditions.
- S8.A.3.2.1: Describe how scientists use models to explore relationships in natural systems (e.g., an ecosystem, river system, the solar system).
- S8.D.1.1.2: Describe natural processes that change Earth's surface (e.g., landslides, volcanic eruptions, earthquakes, mountain building, new land being formed, weathering, erosion, sedimentation, soil formation).
- S8.D.1.3.3: Distinguish among different water systems (e.g., wetland systems, ocean systems, river systems, watersheds) and describe their relationships to each other as well as to landforms.
- S8.D.1.3.4: Identify the physical characteristics of a stream and how these characteristics determine the types of organisms found within the stream environment (e.g., biological diversity, water quality, flow rate, tributaries, surrounding watershed).

PA Standards

- 3.3.4.A1 Describe basic landforms. Identify the layers of the earth. Recognize that the surface of the earth changes due to slow processes and rapid processes.
- 3.3.4.A6
 - MODELS/SCALE Identify basic landforms using models and simple maps.
 - CONSTANCY/ CHANGE Identify simple changes in the earth system as air, water, soil and rock interact.
 - SCALE Explain how basic weather elements are measured.
- 3.3.5.A1 Describe how landforms are the result of a combination of destructive forces such as erosion and constructive erosion, deposition of sediment, etc.
- 3.3.6.A1 Recognize and interpret various mapping representations of Earth's common features.
- 3.3.6.A2 Examine how soil fertility, composition, resistance to erosion, and texture are affected by many factors.
- 3.3.7.A6
 - MODELS/SCALES Locate significant geologic structures using various mapping representations.
 - CONSTANCY/ CHANGE Describe changes in atmospheric conditions associated with various weather patterns.
 - CONSTANCY/ CHANGE SCALE Describe geologic time as it relates to earth processes.
- 3.3.8.A1 Distinguish between physical and chemical weathering. Compare and contrast the types of energy that drive Earth's systems.

Next Generation Science Standards



- 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.
- MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
- MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Enrichment Opportunity - Carver Science Fair

Encourage your students to conduct an investigation to enter into the Carver Science Fair this year. This Philadelphia tradition has been going for 37 years. Please see this website for more information: www.carversciencefair.org.

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