

Unit 4: Earth and Geologic Changes

Content Area: **Science**
Course(s): **Science 8**
Time Period: **April**
Length: **4 weeks**
Status: **Published**

Transfer

Earth and Geologic Changes

Chapter 13: 5 blocks

Chapter 14: 5 blocks

Total: 10 blocks

Enduring Understandings

Minerals and rocks form through natural processes, have practical uses in everyday life, and are valued for their beauty. Minerals can be identified based on their physical properties. Rocks are classified based on their physical characteristics and how they formed.

The theory of plate tectonics states that Earth's lithosphere is broken up into rigid plates that move over Earth's surface.

Most earthquakes occur along plate boundaries where plates slide past each other, collide, or separate. Volcanoes form at subduction zones, mid-ocean ridges, and hot spots.

Evidence from fossils, rock layers, and radioactivity help scientists understand Earth's history and determine the ages of Earth's rocks.

The geologic changes that have occurred during the billions of years of Earth's history have strongly affected the evolution of life.

Essential Questions

How are minerals and rocks formed, identified, classified, and used?

How do surface processes contribute to the rock cycle?

How is the rock cycle related to plate tectonics?

What evidence supports continental drift?

What is seafloor spreading?

What evidence is used to support seafloor spreading?

What is the theory of plate tectonics?

What are the three types of plate boundaries?

Why do tectonic plates move?

What is an earthquake?

Where do earthquakes occur and how do scientists monitor earthquake activity?

How do volcanoes form?

What factors contribute to the eruption style of a volcano?

How are volcanoes classified?

What are fossils and how do they form?

What can fossils reveal about Earth's past?

What is the difference between relative age and absolute age?

How can the position of rock layers be used to determine the relative ages of rocks?

How can radioactive decay be used to date rocks?

How was the geologic time scale developed?

What are some causes of mass extinction?

How is evolution affected by environmental change?

Content

Vocabulary

Vocabulary

Chapter 13 (Rocks and Minerals):

Mineral, Crystal structure, Crystallization, Streak, Luster, Cleavage, Fracture, Ore,

Rock, Grain Magma, Lava Texture, Sediment Lithification, Foliation, Rock cycle

Extrusive rock Intrusive rock, Intrusive rock, Uplift, Deposition

Chapter 14 (Plate Tectonics):

Pangaea, Continental drift, Mid-ocean ridge, Seafloor spreading, Normal polarity

Magnetic reversal, Reversed polarity, Plate tectonics, Lithosphere, Divergent plate boundary, Transform plate boundary, Convergent plate boundary, Subduction

Convection, Ridge push, Slab pull

Chapter 15 (Earthquakes and Volcanoes):

Earthquake, Fault, Seismic wave, Focus, Epicenter, Primary wave, Secondary wave

Surface wave, Seismologist, Seismometer, Seismogram, Volcano, Magma, Lava

Hot spot, Shield volcano, Composite volcano, Cinder cone, Volcanic ash

Chapter 16 (Clues to Earth's Past):

Fossil, Catastrophism, Uniformitarianism, Carbon film, Mold, Cast, Trace fossil

Paleontologist, Relative age, Superposition, Inclusion, Unconformity, Correlation

Index fossil, Absolute age, Radioactive decay, Half-life

Chapter 17 (Geologic Time):

Eon, Era, Period, Epoch, Mass extinction, Land bridge, Geographic isolation, Paleozoic era, Mesozoic era, Cenozoic era, Inland sea, Coal swamp, Supercontinent

Dinosaur, Plesiosaur, Pterosaur, Holocene epoch, Pleistocene epoch, Ice age

Glacial groove, Mega-mammal

Resources

Learning Objectives

MS.Earth's Systems

Describe how minerals are formed using a scientific explanation based on evidence for how the uneven distributions of Earth's mineral resources are the result of past and current geoscience processes.

Identify properties of used to classify minerals.

Explain how minerals are used in everyday products, such as makeup and toothpaste.

Classify rocks based on their texture and composition.

Differentiate between igneous, sedimentary, and metamorphic rock.

Illustrate how surface processes contribute to the rock cycle by developing a model to describe the cycling of Earth's materials and the flow of energy that drives this process

Describe the role of thermal energy in the rock cycle.

MS.History of Earth

Analyze the evidence that supports the continental drift hypothesis.

Explain how seafloor spreading provides a mechanism for continental drift.

Describe how scientists arrived at the theory of plate tectonics using an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales

Differentiate between the three types of plate boundaries.

Explain how location of earthquakes, volcanoes, and mountain ranges are related to plate tectonics.

Explain how earthquakes can be used to study the composition and structure of Earth's interior and to identify the location of active faults.

Describe methods scientists use to monitor earthquakes.

Illustrate the process of a volcanic eruption.

Explain the factors that contribute to the eruptions style of a volcano.

Differentiate between a cinder cone, shield volcano, and composite cone.

Debate between uniformitarianism and catastrophism.

Explain how fossils are formed and how they are used to reveal clues about Earth's past.

Distinguish between relative age and absolute age.

Describe how radioactivity decay can be used to date rocks.

Explain how geologists organize Earth's history.

Determine the cause of mass extinction.

Create a poster or another type of visual presentation illustrating the major geologic events of the Paleozoic, Mesozoic, and Cenozoic eras.

Explain how scientists used fossil evidence to determine major geologic events that occurred during each era.

Resources

Resources

www.pbslearningmedia.org

✖ <https://www.khanacademy.org/science>

iScience Course 3

Chapters 13, 14, 15, 16

Standards

LA.RH.6-8	Reading History and Social Studies
LA.RST.6-8	Reading Science and Technical Subjects
6-8.MS-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
6-8.MS-ESS2-3	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
6-8.MS-ESS2-1	Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.
6-8.MS-ESS1-4	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
6-8.MS-ESS1	Earth's Place in the Universe
6-8.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.
6-8.MS-ESS3	Earth and Human Activity
6-8.MS-ESS2	Earth's Systems
6-8.MS-ESS2-4	Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
6-8.MS-LS4	Biological Evolution: Unity and Diversity
6-8.MS-LS4-1	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.
	Range of Writing
	Production and Distribution of Writing

