

Eighth Grade

Geology

Plate Tectonics

Initial Understanding

Recall the layers of the earth.

List the physical properties of each of the earth's layers.

Define oceanic and continental crust.

Examine Wegener's continental drift theory.

List and describe the following evidences of crustal movement: landforms, fossils, climate, and sea-floor spreading.

Define the Theory of Plate Tectonics and the mechanisms that cause it such as convection currents.

Describe the three types of plate boundaries.

Developing an Interpretation

Explain how the physical conditions inside the planet influence crustal movement.

Predict the effects of convection currents on the crust.

Explain how the difference between oceanic and continental crust affects the way they interact.

Apply the knowledge of crustal movement to explain the theory of Plate Tectonics.

Predict the location of the tectonic boundaries by interpreting volcanoes and earthquake positions.

Making Connections

Design models that represent tectonic processes.

Discuss important land formations worldwide for example: Himalayas, Andes, San Andreas Fault, Japan, and Hawaii.

Critical Stance

Judge whether the pros outweigh the cons for living near active plate boundaries and if people living in those areas should be made more aware of the dangers associated.

Creation of Landforms by Volcanoes and Earthquakes

Initial Understanding

Describes forces that cause earthquakes.

Define stress.

List the types of stress.

List the types of faults.

Define seismic waves and epicenter.

Recall the definition of volcano.

Name the characteristics of different types of volcanoes.

Define magma and lava.

Developing an Interpretation

Explain how seismic waves are generated.

Predict how seismic waves traveling through rock layers affect the land.
Describe the relationship between folding, faulting, and earthquakes in the formation of landforms.
Predict how thin or thick magma/lava produce different volcanic landforms.
Compare and contrast volcanic activity underwater, on continents, and forming volcanic islands.

Making Connections

Discuss how plate motion, fault type, and earthquake characteristics play a role in the creation of the rift valley in Africa, the Himalayas, and San Andreas Fault.
Discuss how Hawaii, Japan, Andes, and Iceland were formed by volcanic activity.
Design models representing the formation of faults and volcanoes.

Critical Stance

Rank the most dangerous places to live in the world based on their proximity to volcanoes and earthquake areas.

Weathering, Erosion, Deposition, and Soil Formation

Initial Understanding

Describe the different types of weathering.
Recall the definition of soil.
Label the layers of soil.
List the different agents of erosion: running water, glaciers, waves, gravity, and wind.
Define deposition.
Define a chemical reaction.

Developing an Interpretation

Explain the chemical reactions involved with chemical weathering by water.
Explain how rocks are broken down to soil through weathering.
Contrast the different types of landforms that result from different types of erosion.

Making Connections

Discuss the creation of U and V-shaped valleys.
Discuss how the erosion of mountains and the deposition in flood plains work together to flatten earth's surface.
Design a model depicting the evolution of a landscape worked on by destructive forces over an extremely long period of time.

Critical Stance

Gauge the risks involved in buying land according to the potential for erosion and mass movement in that area.

Rock Cycle

Initial Understanding

Describe the three types of rock: sedimentary, igneous, metamorphic.
Define fossils.

Developing an Interpretation

- Explain the process of formation for each type of rock.
- Predict how a rock changes from one type to another.
- Explain how plate tectonics play a role in the rock cycle.
- Explain how weathering and erosion play a role in the rock cycle.
- Decide what kinds of rock are best for fossils.

Making Connections

- Design a model of the rock cycle.
- Guess the type of rock from typical samples.

Critical Stance

- Gauge how the external and internal sources of energy affect the rock cycle.

Meteorology

Initial Understanding

- Describe the composition of the atmosphere
- Sequence the layers of the atmosphere
- Define radiation, conduction and convection
- Describe the measurable factors of weather (i.e. temperature, pressure and humidity)
- Describe the water cycle
- Define weather, air mass, and front
- Name the four types of fronts
- Name the major types of clouds
- Name the major storm types
- Name the two types of atmospheric pressure
- Identify major weather symbols used on weather maps

Developing an Interpretation

- Discuss the relationship between weather and the effects of radiation, convection, and conduction
- Hypothesize ways human influence global warming
- Explain the relationship between the water cycle and cloud formation
- Explain the relationship between the cloud's name, height, and structure
- Illustrate the four types of fronts
- Explain the relationship between air pressure systems and fronts
- Interpret weather symbols from a map in order to predict the weather
- Explain the difference between a hurricane, a thunderstorm, and a tornado

Making Connections

- Discuss the Coriolis Effect on wind patterns
- Compare the unequal heating of the earth's surface and differences in air pressure in the formation of winds

Evaluate the reasons why Connecticut has Nor'easters and California does not
Construct a table showing the various ways to prepare for different severe weather phenomena

Critical Stance

Articulate the impact of human activity on the greenhouse effect
Examine the evidence for and against the existence of global warming
Determine the weather instruments you would need to become part of a local television station's reporting system

Astronomy

Earth's Moon System

Initial Understanding

Define weight and mass
Define gravity
Define rotation and revolution
Describe patterns of revolution and rotation between the sun, earth, and moon
Name the phases of the moon
Define solar and lunar eclipses
Define tides
Name the different types of tides
Name the four seasons
Recall the dates of the two equinoxes and solstices

Developing an Interpretation

Explain the difference between weight and mass
Explain affect of gravity on the orbital movement of planet in the solar system
Explain revolution and rotation as it pertains to the sun, earth, and moon
Explain why you only see one side of the moon
Compare solar and lunar eclipses
Describe the relationship between the tides, the earth's rotation, and the moon
Explain the reason why there are different types of tides
Explain the effect on earth's tides by the sun and moon

Making Connections

Model the patterns of revolution and rotation between the sun, earth, and moon
the sun, earth and moon
Model the phases of the moon
Design a model showing both a lunar and solar eclipse
Discuss the relationship between a lunar calendar and a modern calendar
Model the relationship between the tilt of the earth and the four seasons

Critical Stance

Defend the need to continue funding lunar exploration