
SYNOPSIS:

Earthquakes are the result of the continuing motion of the earth's crust and the movement of its tectonic plates. While earthquakes are among nature's most destructive events, their risk is high only where there are faults in the Earth's crust.

This program illustrates how earthquakes are generated, measured, and how technology can help improve preparedness and building safety.

CURRICULUM UNITS:

Earth Science
Geology
Plate tectonics
Seismology
Volcanology

CAREER OPPORTUNITIES:

Engineer
Geologist
Geophysicist
Oil Explorer
Seismologist
Volcanologist

PROGRAM OVERVIEW:

The Earth's crust is broken into several massive pieces. Driven by forces deep within, these plates are in constant motion. Earthquakes are most likely to occur when plates slide against each other at a fault line.

The epicenter is on the surface directly above the focus. The damage an earthquake can cause depends on its magnitude and how close the epicenter is to a city. Seismographs are used to determine an earthquake's magnitude as well as to try and predict when and where they may happen. This will help scientists to decide when the "big one" may happen.

Also, by studying these charts and fault lines, scientists are able to see how the earth's surface was formed and deformed. This information has led to the belief that some 250 million years ago there was one super continent known as Pangaea.

ISSUES AND CRITICAL THINKING:

1. After showing this program, ask your students the following:
 - What is a tectonic plate?
 - What happens when two plates slide past each other?
 - What events create volcanoes?
 - What are some of the methods that scientists use to study the earth?
 - What is the Richter scale and what does it measure?
2. Discuss famous volcanic eruptions and compare their similarities and differences.
3. Locate the nearest fault line or volcano. Discuss seismic activity and how building codes protect residents.
4. Have students cut out various pieces of a map and reconstruct Pangaea.
5. Talk about how seismic waves enable scientists to "see" inside the earth.
6. Have students make a study of earthquakes all over the world over the past 10 years, mapping place and magnitude.
7. Recreate a volcanic eruption. On a poster-sized grid, place a brown bag full of baby powder, pencil shavings and small bits of gravel. Pop the bag and have students measure how far the lava traveled.

GLOSSARY:

CRUST- the cool outer shell of the Earth, made from rock, stone and mineral deposits.

CUSHION LAVA- masses of lava that flow from an underwater eruption.

FAULT LINES- cracks in the Earth's crust.

LATITUDE- the distance north or south of the equator.

MOLTEN- made liquid by heat.

POLARITY- related to the north or south poles of a magnet.

PRESSURE- the force applied over a surface.

RADIUS- a line segment that joins the center of a circle to the circumference.

SEISMIC- pertaining to or caused by an earthquake or earth vibrations.

SEISMOMETER- a device that measures seismic motions of the earth.

SILICATES- compounds that contain silica, oxygen, and one or more metals.

STRATIFIED- formed or arranged in layers.

SUBDUCTION- when an edge of one tectonic plate is forced below the edge of another.

TECTONICS- the study of the earth's structural features.

THEODOLITE- a telescope used to measure angles in surveying meteorology.

VARIATION- a change in form, position, or condition.

The Wonders of Earth Science



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UNDERSTANDING EARTHQUAKES



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