
SYNOPSIS:

Erupting volcanoes, crushing earthquakes, blasting geysers, and boiling mud are just a few of the awesome natural forces shaping our planet every day. In this program we'll journey deep inside our planet to witness these powerful and violent forces.

We'll also travel back millions of years to learn how an enormous super continent broke apart to form today's land masses, and then peer into the future to see how the earth may look millions of years from now.

CURRICULUM UNITS:

Earth Science
General Science
Geography
Geology
Oceanography
Seismology

CAREER OPPORTUNITIES:

Archaeologist
Cartographer
Ecologist
Engineer
Geographer
Geologist
Geophysicist
Instrument Technician
Oceanographer
Seismologist
Surveyor
Volcanologist

PROGRAM OVERVIEW:

Your student's imaginations will be charged as they discover some of the Earth's ancient secrets revealed in this program. They'll learn that our planet is in a continual state of change, tearing down and rebuilding it constantly to form the vast mountain ranges, continents and land masses we know today.

Students will dive below the crust of the earth to learn that layers of hot, molten rock called magma form the mantle of the earth. They will be taken into the core where temperature reaches over 14,000 degrees Fahrenheit. Students will discover that some volcanoes may be active, while others remain dormant.

Although destructive, volcanoes can create new lands rich for farming, or provide necessary minerals in their rocks.

ISSUES AND CRITICAL THINKING:

1. After showing the program, ask students the following:
Why do volcanoes erupt?
How do volcanoes create new land in the sea?
How were today's continents able to drift away from the super continent 300 million years ago?
Why do earthquakes occur?
What are some of the signs that tell us that Yellowstone Park is still geologically active?
2. On the board, draw a circle to represent the Earth in cross-section, and have students come forward to draw in and label the layers. Make a simple drawing of a volcano in cross-section and discuss how magma from the mantle is expelled lava. You might do the same for a geyser.
3. If any students have experienced an earthquake, ask them to describe their experiences. If you live in an area, which has earthquakes, discuss what to do when they occur.
4. Is your area geologically active? Have students report on local earthquakes or volcanic eruptions. If your area is inactive, talk about the natural forces that may have shaped it.
5. Have one half of your class look up the locations of major earthquakes, and the other volcanic eruptions. Provide each group with a world map and pins to mark occurrences. Discuss what students can surmise from comparing the two maps, such as where earthquakes and eruptions have most often occurred, whether they usually happen in the same area or totally different regions, in the mountains or desert areas etc. are the areas of heaviest occurrence along known fault lines?

GLOSSARY:

ACTIVE VOLCANO- An erupting volcano, or one in which conditions could lead to eruption.

BLACK SMOKER- Undersea geysers that form “chimneys” of mineral deposits where volcanic vents bring magma close to the ocean floor.

CONTINENTAL DRIFT- A theory that the continents were once part of one enormous super continent, but broke off and slowly moved over the Earth’s surface, carried on huge plates of the Earth’s crust which are floating on the hot liquid rock that makes up its mantle.

CONTINENTS- The major landmasses of the Earth.

CORE- The center of the Earth.

CRUST- The outer layer of the Earth that supports the landmasses and ocean floor.

DORMANT VOLCANOES- Volcanoes that are inactive or not likely to erupt.

EARTHQUAKE- Shock waves caused when adjacent plates in the Earth’s crust suddenly shift.

FAULT- A crack in the Earth’s crust.

GEYSER- A natural spring that ejects hot water and steam.

LAVA- Molten rock that is expelled from a volcano or otherwise reaches Earth’s surface.

MAGMA- Molten rock within the Earth that makes up the mantle layers beneath the crust.

MANTLE- Layers within the Earth between the crust and the core, made of molten rock.

PLATES- Sections of the Earth’s crust that float on the molten rock of the mantle.

VOLCANO- A vent in the Earth’s crust where lava and gasses escape.

The Wonders of Earth Science



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EARTH SCIENCE: OUR CHANGING PLANET



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