



#8704

EARTH-OUR CHANGING PLANET

Grade Levels: 3-8

14 minutes

ALLEGRO PRODUCTIONS 1996

DESCRIPTION

Volcanoes and earthquakes! Geysers and boiling mud! Natural forces like these have been working for millions of years, changing the surface of the earth. Examines the layers of earth, a history of continental drift, plate tectonics, and other phenomena at work on our planet.

INSTRUCTIONAL GOALS

1. To introduce the concept that the earth is in a continual state of change, tearing down and rebuilding itself constantly to form the vast mountain ranges, continents and landmasses we know today.
2. To depict the different layers of the earth.
3. To investigate earthquakes.
4. To demonstrate the theory of continental drift.

BACKGROUND INFORMATION

Discover some of earth's ancient secrets! Learn that our planet is in a continual state of change, tearing down and rebuilding itself constantly to form the vast mountain ranges, continents and landmasses we know today.

Dive below the crust, earth's outer layer, to learn that layers of hot, liquid rock called *magma* form the mantle of the earth. Then drop to the very center, or core, of the earth where temperatures reach over 14,000 degrees Fahrenheit. Witness some of nature's most spectacular fireworks when pressure forces the magma to the earth's surface and volcanoes explode into eruption, spewing fiery lava. Discover that some volcanoes may be active, that is, conditions inside could build toward an eruption, while others are dormant, and not likely to erupt.

Some viewers may have visited Yellowstone National Park and witnessed spraying geysers, boiling mud, and hot springs, all the result of hot magma coming close to the surface. In the oceans, undersea geysers called *black smokers* form "chimneys" of pure mineral deposits where volcanic vents bring hot magma close to the ocean floor. Investigate earthquakes, terrifying events which cause the earth to shudder and shake in violent fits. They are the result of great stress and pressure on the huge sections, or plates, of the earth's crust that "float" on the magma of the mantle. The most



vulnerable spots for earthquakes are along faults, fractures, or cracks in the earth's crust where the plates meet.

See how, according to the theory of continental drift, today's large landmasses, or continents, were once combined in one enormous landmass, or supercontinent. Also peek 50 million years into the future to see how continental drift may progress. While seething magma can sometimes make dramatic changes overnight, drifting plates carrying landmasses can take millions of years to reshape the landscape. Fast or slow, however, these intense natural forces are at work every moment, every day, shaping our planet.

VOCABULARY

- | | |
|----------------------|-------------|
| 1. active volcano | 9. fault |
| 2. black smoker | 10. geyser |
| 3. continental drift | 11. lava |
| 4. continents | 12. magma |
| 5. core | 13. mantle |
| 6. crust | 14. plates |
| 7. dormant volcanoes | 15. volcano |
| 8. earthquake | |



AFTER SHOWING

Discussion Items and Questions

1. Why do volcanoes erupt?
2. How do volcanoes create new land in the sea?
3. How were today's continents able to drift away from the supercontinent 300 million years ago?
4. Why do earthquakes occur?
5. What are some of the signs that tell us that Yellowstone Park is still geologically active?
6. If 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.
7. Is your area geologically active? Have students report on local earthquakes or volcanic eruptions. If your region is inactive, talk about the natural forces that may have shaped it.
8. How do scientists monitor areas prone to earthquakes and volcanic eruptions? How do volcanologists study volcanoes?
9. Explain the real meaning of values on the Richter scale. Discuss how a simple seismograph can be made.



Applications and Activities

1. 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 as lava. You might do the same for a geyser.
2. Have one half of your class look up the locations of major earthquakes, the other volcanic eruptions. Provide each group with a world map and pins to mark occurrences. What can be surmised 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 mountainous or desert areas, etc.? Are the areas of heaviest occurrence along known fault lines?
3. Have students research accounts of major volcanic eruptions in the past and relatively recent and well-documented eruptions such as Mount St. Helens. How did the eruptions change the areas in which they occurred? Did they have any effect on the weather?
4. Provide a world map. Cut apart the continents and let students try to reassemble them as the "supercontinent."



RELATED RESOURCES



Captioned Media Program

- Earthquakes & Mountains #8706
- Geology: Our Restless Planet #3037

World Wide Web



The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and "kid-safe" sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **NATIONAL EARTHQUAKE INFORMATION CENTER**
<http://wwwneic.cr.usgs.gov/neis/eqlists/10maps.html>
- **USGS EARTHQUAKE HAZARDS PROGRAM**
<http://earthquake.usgs.gov/>
- **GLOBAL VOLCANISM PROGRAM**
<http://www.volcano.si.edu/gvp/>