

#9141

EXPLORERS OF VOLCANOES AND EARTHQUAKES

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Grade Levels: 6-10

25 minutes



DESCRIPTION

Photographers and scientists try to explain their fascination with volcanoes and earthquakes. Focuses not on the geological causes, but on how and why these phenomena are photographed and studied. Uses actual footage and closeups for impact. James Earl Jones narrates.

ACADEMIC STANDARDS

Subject Area: Geography: Physical Systems

- Standard: Knows the physical processes that shape patterns on Earth's surface
 - Benchmark: Knows the major processes that shape patterns in the physical environment (e.g., the erosional agents such as water and ice, earthquake zones and volcanic activity, the ocean circulation system)

Subject Area: Science: Earth and Space Sciences

- Standard: Understands earth's composition and structure
 - Benchmark: Knows how land forms are created through a combination of constructive and destructive forces (e.g., constructive forces such as crustal deformation, volcanic eruptions, and deposition of sediment; destructive forces such as weathering and erosion)
 - Benchmark: Knows effects of the movement of crustal plates (e.g., earthquakes occur along the boundaries between colliding plates; sea floor spreading occurs where plates are moving apart; mountain building occurs where plates are moving together; volcanic eruptions release pressure created by molten rock beneath the Earth's surface)

INSTRUCTIONAL GOALS

1. To emphasize that volcanic eruptions near populated areas can be disastrous.
2. To observe the level of destruction caused by a volcanic eruption depends on several factors.
3. To compare the three types of volcanoes: shield, cinder cones, and composite.
4. To compare the different types of earthquake waves and the impact they can have.
5. To illustrate why an earthquake can affect different parts of a city in different ways.
6. To demonstrate the importance of taking substrate and construction design into consideration when preparing a city for an earthquake.

VOCABULARY

1. continental plates
2. fissure
3. gas cloud
4. guttural
5. Hawaii Volcanoes National Park at Big Island, Hawaii
6. Hiroshima, Japan
7. hydrochloric acid clouds
8. Kilauea volcano
9. magma chambers
10. Mauna Loa
11. Montserrat (British), the Caribbean
12. Pele (goddess), Pele's hair
13. San Andreas Fault



AFTER SHOWING

Discussion Items and Questions

1. Look at pictures of geology of the Hawaiian Islands from the southeastern and newest, Big Island to the northwestern and oldest, Midway, in terms of the geography of each island along the way. What has time done to their appearance?
2. Look at pictures of the two big volcanoes on the Big Island, Mauna Kea (inactive) and Mauna Loa (active). They are shield volcanoes. What does that mean? How are they different in form from Mts. Shasta or Lassen in California, or Vesuvius and Etna in Italy? Why?
3. What is the *Richter scale* and how is it measured? What is the difference in magnitude between a 5.5 and a 5.6 quake, or a 5.5 and 6.5?
4. It is said that it is not so much the magnitude of the earthquake as its period that causes damage. What does that mean? What does it mean that in earthquakes we are killed by our possessions? Why is fire usually the most destructive aspect?
5. What part may the 1989 baseball World Series have played in keeping casualties to a fairly small number during the San Francisco Bay Area earthquake?

Applications and Activities

1. The first pyroclastic eruption photographed was that of Mt. St. Helens in 1980. Find out how that eruption helped explain what happened to Pompeii and Herculaneum in 79 A.D.
2. Find out what the cloud from the Mt. St. Helens caused to the weather downwind and how far the cloud traveled.
3. In 1923 an 8.3 earthquake leveled Yokohama and Tokyo, Japan, killing 200,000+. The American architect, Frank Lloyd Wright, had recently built the Imperial Hotel there. Find out what he designed that caused the hotel to withstand the quake.

RELATED RESOURCES



Captioned Media Program

- Bill Nye the Science Guy: Earthquakes #3572
- Bill Nye the Science Guy: Volcanoes #3581
- Earth—Our Changing Planet #8704
- Earthquakes & Mountains #8706
- The Pacific Edge #2420



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.

- **USGS VOLCANO HAZARDS PROGRAM**

<http://volcanoes.usgs.gov/>

Keep up to date with U.S. and worldwide volcano reports, feature stories; take a look at the photo glossary; see how a volcano is monitored, and more information is provided on this U.S. Geological Survey site.

- **USGS EARTHQUAKE HAZARDS PROGRAM**

<http://earthquake.usgs.gov/>

From the United States Geological Survey, click on “FAQ” and review answers to numerous questions about earthquakes. “Current Earthquake Information,” “Common Myths About Earthquakes,” “Measuring Earthquakes,” “Earthquake Effects & Experiences,” and much more.

- **VOLCANO WORLD**

<http://volcano.und.edu/vw.html>

Current eruptions, ask a volcanologist, volcano adventures, today in volcano history, click on a region to view images of volcanos, and other information is found on this University of North Dakota link.

- **DISASTERS: EARTHQUAKES**

<http://www.fema.gov/diz01/eqquakes.htm>

The Federal Emergency Management Agency (FEMA) explains what are earthquakes and what causes them, how to plan for an earthquake, what to do during and after an earthquake, and provides other helpful information.