

# Volcanoes: Identifying and Understanding the Natural Phenomena

## Lesson Plan

**Grade Level:** 6-8

**Curriculum Focus:** Volcanoes; Scientific Inquiry

**Lesson Duration:** Two class periods

### Student Objectives

- Scientists continuously gather and interpret data to identify and understand patterns among certain natural phenomena around the world, such as volcanoes.
- Volcanoes have occurred in many spots worldwide.

### Materials

- Video on *unitedstreaming: Volcanoes: Mountains of Fire*  
Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- Earth's Structure and the Formation of Volcanoes
    - Subduction, Magma Chambers, and the Eruption of Volcanoes
  - The Eruption of Mount Saint Helens in Washington State, USA
    - A Typical Hawaiian Eruption
  - Types of Volcanoes
- Discovery School video on *unitedstreaming: Earth Science: Volcanoes*  
Search for this video by using the video title (or a portion of it) as the keyword.

Selected clips that support this lesson plan:

- Volcanology: The Science of Predicting Volcanoes

- Printed reference sources about volcanoes
- Computer with Internet access
- Map of world
- Map showing tectonic plate boundaries

## **Procedures**

1. Introduce the concept that scientists continuously gather and interpret data to identify and understand patterns among natural phenomena around the world. For example, scientists may study volcanic eruptions in one part of the world to learn about eruptions elsewhere. They may also study patterns of volcanic eruptions to understand when and where eruptions tend to occur.
2. Assign groups of students to research information about each of the following volcanoes:
  - Etna, Italy
  - Lassen Peak, California
  - Mauna Loa, Hawaii
  - Paricutín, Mexico
  - Kelut, Indonesia
  - Helgafell, Iceland
  - Mount Saint Helens, Washington
  - Kilauea, Hawaii
  - Pinatubo, Philippines
  - Galeras, Colombia
3. Specifically, direct students to gather the following information for their assigned volcano:
  - Type of volcano
  - Date of most recent (or most significant) event
  - Casualties
  - Other measures of impact
  - Eruptive force
  - Magma composition (silica and water vapor)
4. Discuss with students where they can find the information they seek. Talk about what kinds of print sources or Internet sites would be most helpful and up to date. You may want to talk about reliability of some Web sites, and how they need to consider the source of the Web sites. In addition, they may want to verify information from one Web site with other Web sites.
5. Have groups work together to create a presentation summarizing the information they gathered. As part of their presentation, they should plot the location of their assigned volcano on a world map.
6. Finally, have your students analyze the world map plotting all the volcanic eruptions. Ask them to determine if there are any patterns they notice among the various volcanoes. At this point,

show them a map of tectonic plate boundaries. Did all the volcanoes fall along these boundaries?

## **Assessment**

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Students worked cooperatively within their groups; gathered all the requested information for their assigned volcano; correctly plotted the volcano's location on a world map.
- 2 points: Students worked well within their groups; gathered most of the requested information for their assigned volcano; correctly plotted the volcano's location on a world map.
- 1 point: Students did not work well within their groups; gathered little of the requested information for their assigned volcano; did not correctly plot the volcano's location on a world map.

## **Vocabulary**

### **caldera**

*Definition:* A large volcanic depression containing volcanic vents that is formed by the collapse of the central part of a volcano or by explosions of extraordinary violence.

*Context:* A caldera, or large crater, is usually formed at the mouth of a volcano after a volcanic eruption.

### **cyanobacteria**

*Definition:* Monerans that contain the pigment chlorophyll and are a main source of food for other organisms.

*Context:* Cyanobacteria are believed to be the first organisms to photosynthesize.

### **ecosystem**

*Definition:* A system in which living organisms interact with each other and their nonliving environment.

*Context:* Yellowstone is a very diverse ecosystem because of its unique geology and vast array of wildlife.

### **geyser**

*Definition:* An intermittent hot spring or fountain from which hot water and/or steam issues.

*Context:* Yellowstone contains numerous geysers that spew out geothermally heated water at regular intervals.

### **magma**

*Definition:* A natural hot melt composed of a solution of rock-forming materials, steam, and super-heated gases from which igneous rock results.

*Context:* Magma is the melted rock material that travels through crustal vents to the Earth's surface. Once the magma has reached the Earth's surface it is referred to as *lava*.

## **Academic Standards**

### **Mid-continent Research for Education and Learning (McREL)**

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit

<http://www.mcrel.org/compendium/browse.asp>.

This lesson plan addresses the following national standards:

- Science – Life Science: Understands relationships among organisms and their physical environment.
- Science – Earth Science: Understands Earth's composition and structure.
- Science – Nature of Science: Understands the nature of scientific inquiry.
- Geography – Places and Regions: Understands the physical and human characteristics of place.
- Geography – Physical Systems: Understands the characteristics of ecosystems on Earth's surface.

### **National Academy of Sciences**

The National Academy of Sciences provides guidelines for teaching science in grades K-12 to promote scientific literacy. To view the standards, visit this Web site:

<http://books.nap.edu/html/nses/html/overview.html#content>.

This lesson plan addresses the following national standards:

- Earth Science: Structure of the earth system

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## **Support Materials**

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the [DiscoverySchool.com](http://DiscoverySchool.com) Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>