

Critical Thinking: Building Near Volcanoes

Overview:

In this lesson, students think critically about what they have learned about volcanic hazards. Working in groups, students build clay models of volcanoes and decide where best to place a town based on the scenario assigned by the teacher.

Objectives:

The student will:

- build on existing knowledge to think critically about a problem;
- construct a shield or composite volcano from clay;
- determine where to build a town based on knowledge of different volcanic hazards; and
- present results to the class.

Materials:

- Modeling clay
- Small model houses (such as found in a board game)
- Cardboard, cut into 1 ft squares
- Marking pens
- Student Information Sheet: “Mauna Loa”
- Student Information Sheet: “Mount St. Helens”
- Student Worksheet: “Building Near Volcanoes”

Activity Procedure:

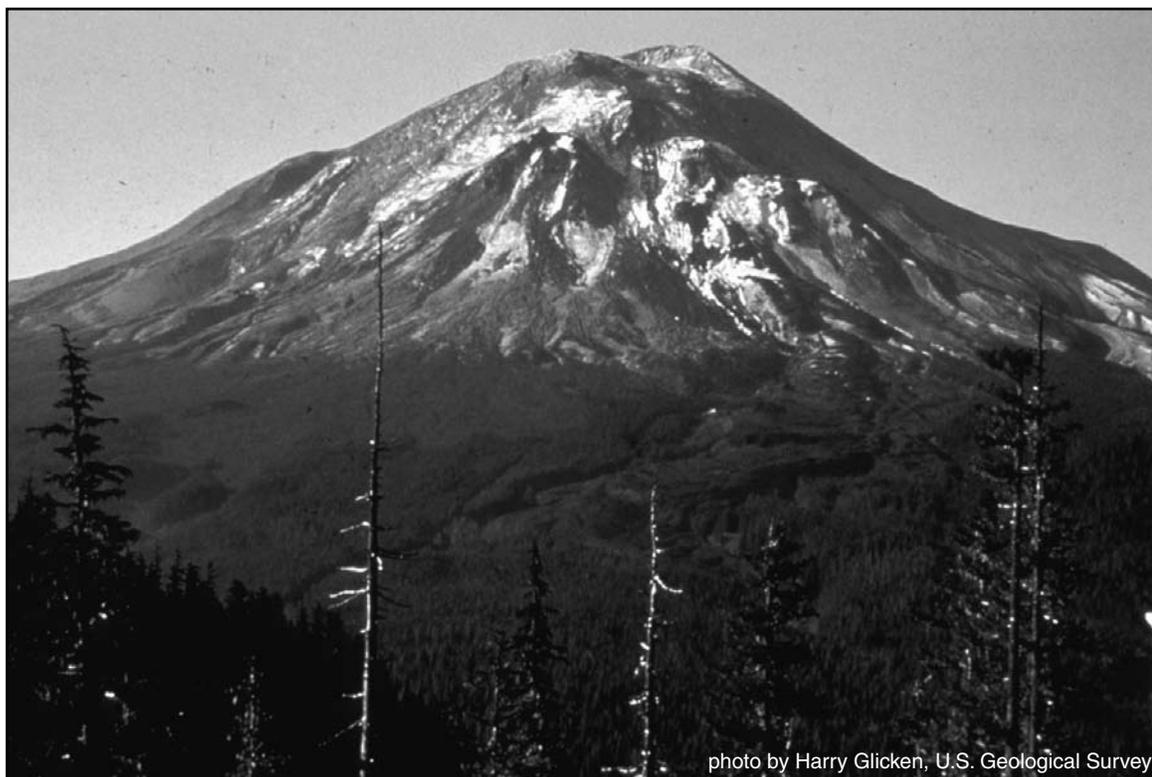
1. Divide the students into groups (suggested size is 2-3 students, but teacher should determine optimal group size depending on class dynamics).
2. Distribute the Student Information Sheet: “Mauna Loa” to half of the groups, and the Student Information Sheets: “Mount St. Helens” to the other half.
3. Instruct students to construct models of the volcano on the information sheet and use what they have learned about volcanic hazards to decide the best location for a town.
4. Distribute the Student Worksheet: “Building Near Volcanoes.”
5. Tell students that they will present their results to the class at the end of the activity.
6. Once all groups have presented, lead a class discussion about similarities and differences in the problem solving approaches.

Answers to Student Worksheet:

This is an oral assignment designed to encourage critical thinking. Student presentations are not graded.

Mount St. Helens

Mount St. Helens is a composite volcano located in southwest Washington. The prevailing winds near Mt. Saint Helens are Westerly winds—this means that they mostly blow from the southwest to the northeast. A large and famous eruption occurred at this volcano in 1980. During that eruption, a large pyroclastic flow traveled north from the volcano, flattening trees and destroying objects in its path.



Mauna Loa

Mauna Loa is a shield volcano that covers a large part of the Big Island of Hawai'i. The prevailing winds near Mauna Loa are Trade Winds. This means that they blow mostly from the northeast to the southwest. Mauna Loa has erupted 39 times since 1832. The most recent eruption occurred in 1984. During this eruption, lava traveled towards the southwest at first, then a new fissure opened and lava traveled northeast towards Hilo for 21 days.



photo by D. Little, U.S. Geological Survey

Building Near Volcanoes

Background Information:

Living near a volcano has benefits as well as drawbacks. The soil is more fertile for growing crops, people can use geothermal energy from volcanic areas for power, and volcanoes often provide pretty scenery. Volcanoes can be dangerous, as well, but people can use information about volcanic hazards to make living near a volcano safer.

Materials:

- Modeling clay
- Small model houses
- Cardboard sheet
- Marking pens

Procedure:

1. Look at the information sheet distributed by the teacher.
2. Working in groups, construct a clay model of this volcano. Build the volcano on a sheet of cardboard. The cardboard represents the area around the volcano, so the volcano should be much smaller than the cardboard.
3. Use the picture in the information sheet as a guideline for the shape of the volcano.
4. Decide which direction will be north on the cardboard. Label north, south, east, and west on the cardboard.
5. The group will build a town somewhere on the sheet of cardboard, using the small model houses. Decide where to build the town after thinking about the following questions:
 - What type of volcano was built, shield or composite?
 - What are the main hazards of this type of volcano (Use information from earlier lessons on this topic)?
 - If there is more than one type of hazard, which one presents the most danger to human life?
 - Which direction (or directions) are the hazards likely to travel?
 - What are the benefits of building the town near the volcano?
 - What are the dangers of building the town near the volcano?
 - How near or far should the town be located from the volcano?
6. Build the town in the chosen location.
7. Present the results to the class. Be sure to tell the class what volcano was built, and why the group chose to build in that location. Plan the presentation so that each member of the group has a chance to speak.