

ON SITE: HAWAIIAN VOLCANO OBSERVATORY

Kilauea, a shield volcano on the island of Hawaii, is one of the world's most active volcanoes and the most dangerous volcano in the United States, according to the United States Geological Survey (USGS). Scientists monitor the conditions of Kilauea at the nearby Hawaiian Volcano Observatory (HVO). The observatory also serves as a laboratory where samples gathered in and around Kilauea can be studied.

Lava collection Imagine standing next to moving lava that is 1170°C. To get a direct measurement of the temperature or to collect a sample, scientists must withstand high temperatures and watch where they step. Samples are collected with heat-resistant materials and immediately cooled in a container with water to prevent contamination from the surrounding air. To protect themselves, volcanologists wear some of the gear shown in the photo.

Seismic activity Earthquake activity beneath a volcano is an indicator of impending eruptions. One way to monitor earthquakes is to check seismic activity. Scientists place seismometers in and around the vents of volcanoes to monitor seismic activity.



Volcanologists often wear helmets, climbing gear, heat-resistant clothing, gas masks, and other gear to protect themselves from dangerous conditions in and around active volcanoes. Once this volcanologist climbs down to the test site, he will put on heat-resistant gloves.

Gas samples Volcanologists collect samples of gases released at vents that they will analyze for sulfur dioxide and carbon dioxide in the HVO laboratory. An increase in sulfur-dioxide or carbon-dioxide emission can indicate a potential eruption.

Ground monitoring An instrument called an electronic distance meter (EDM) helps scientists monitor the ground around volcanoes and predict an eruption. As magma rises toward Earth's surface, the ground might tilt, sink, or bulge from pressure.

Volcanologists at HVO are constantly recording data, running tests, and making advances around the world. Without their research, we might not understand volcanoes as well as we do today.

WRITING in Earth Science

Research the methods scientists use to predict time, size, and type of eruption. Visit glencoe.com for more information. Summarize your findings and share your research with your classmates.

GEOLAB

INTERNET: PREDICT THE SAFETY OF A VOLCANO

Background: Some volcanoes are explosively dangerous. Along with clouds of ash and other volcanic debris, pyroclastic flows, landslides, and mudflows are common volcanic hazards. However, an explosive volcano might not be a hazard to human life and property if it is located in a remote area or if it erupts infrequently.

Question: *What factors should be considered when evaluating a volcano?*

1. Read and complete the lab safety form.
2. Form a team of scientists of three to four people.
3. Within your team, brainstorm some factors you might use to evaluate the volcanoes. Record your ideas. You might include factors such as eruption interval, composition of lava, approximate number of people living near the volcano, and the date of the last known eruption.
4. With your group, decide which factors you will include.
5. Use the factors you have chosen to create a data table. Make sure your teacher approves your table and your factors before you proceed.
6. Visit glencoe.com (or use the information your teacher provides) and select a country where there is a known volcano.
7. Complete your data table for your first country.
8. Repeat Steps 6 and 7 for two more countries.

Analyze and Conclude

1. **Interpret Data** Is it safe for people to live close to any of the volcanoes? Why or why not?
2. **Interpret Data** Do any of the volcanoes pose an immediate threat to the people who might live nearby? Why or why not?
3. **Conclude** Prepare to present your findings to a group of scientists from around the world. Be sure to include your predictions and recommendations, and be prepared for questions. Display your data table to help communicate your findings.

Helicopters transport researchers to remote volcanic sites. Researchers analyze data to determine hazards to humans.

Materials

Internet access to glencoe.com or volcano data provided by your teacher
current reference books with additional volcano data
markers or colored pencils

Procedure

Imagine that you work for the United States Geological Survey (USGS) and are asked to evaluate several volcanoes around the world. Your job is to determine if the volcanoes are safe for the nearby inhabitants. If the volcanoes are not safe, you must make recommendations to ensure the safety of the people around them.

SHARE YOUR DATA

Peer Review Visit glencoe.com and post a summary of your recommendations for each of your volcanoes. Compare and contrast your data with that of other students who completed this lab.