



Smithsonian

**Exploring**

**Volcanic**

**Activity**

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# Take Cover!

Imagine you are a fisher in the year AD 79. You have just docked near a market in Pompeii, Italy. While your crew unloads the ship, you enjoy the sea breeze. Suddenly, you hear shouts from the streets. Black clouds fill the sky.

Someone shouts as they pass, “Mount Vesuvius is erupting!” Mount Vesuvius is the nearby volcano. Crowds of people run for their lives. **Ash** makes it hard to breathe. When will it stop?



# What Is a Volcano?

Disasters such as Vesuvius inspire scientists to study volcanoes. Volcanoes may seem like they won't affect you, but people all over the world live near active volcanoes. Active volcanoes are those that have erupted in the last 10,000 years.

Volcanoes come in different shapes and sizes. Scientists can learn a lot about the planet by studying volcanoes. They are like windows into Earth. They help scientists see what is inside.

Scientists who study volcanoes have a special title. They are called volcanologists (vohl-kuh-NAH-luh-jists). They travel to volcanoes to learn from them. They try to figure out how volcanoes work and where they occur.



Mount Vesuvius is still active! It last erupted in 1944.



# Being a Volcanologist

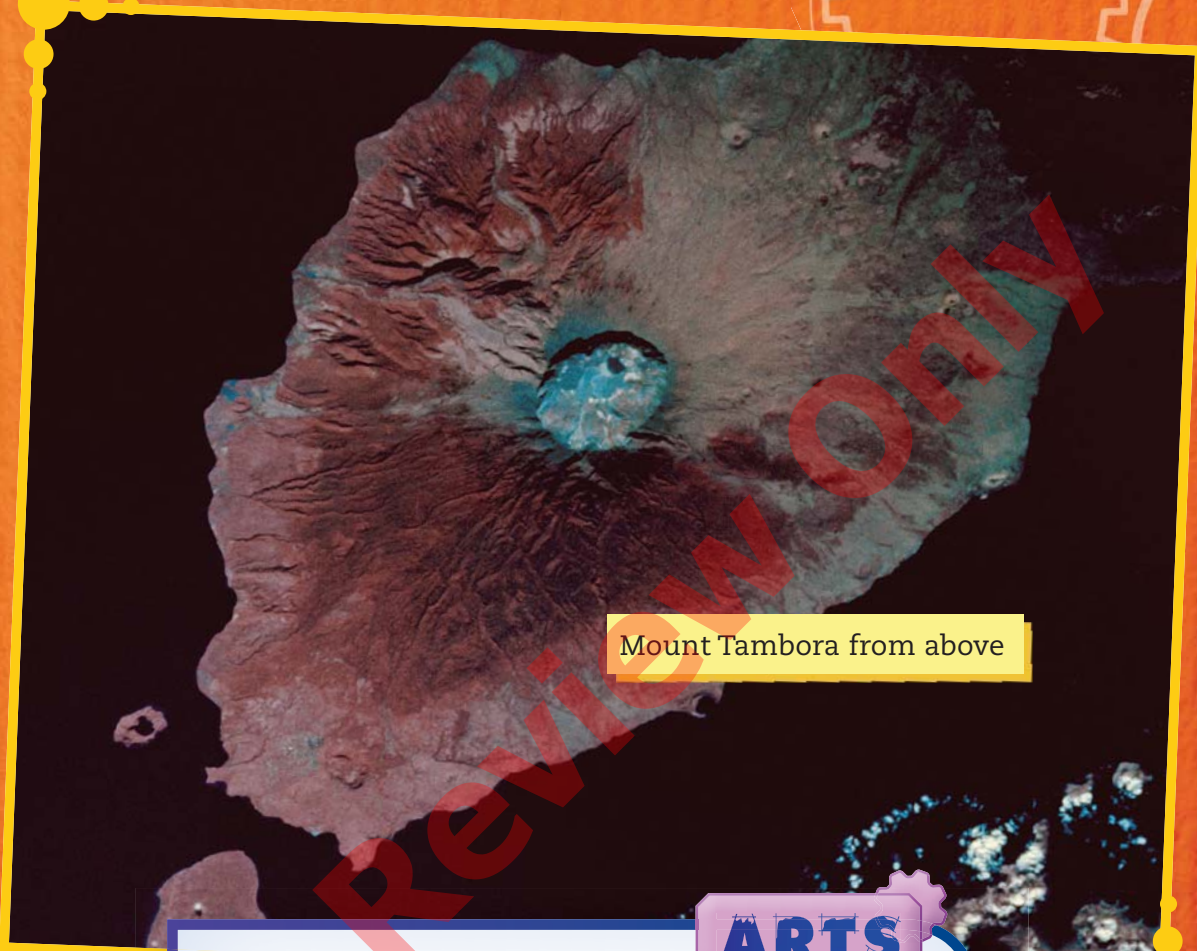
Earth has a long history. Volcanoes are a big part of that past. They leave clues, such as gases and rocks. Volcanologists study these clues. They can learn a lot from volcanoes. They can learn about Earth's past. They can learn about **geology**, too. Volcanoes are geology in action.

Volcanologists have exciting jobs. They travel all over the world to study volcanoes. Sometimes, they ride in helicopters to get to the top of volcanoes. They may travel to volcanic islands. Once there, they may have to do a lot of hiking up mountains and hills. When they reach their destinations, they dig for samples. They take notes of what they see. Then, they go home and record their data.

They can share it with other volcanologists. The data they gather are like tiny time capsules from the earth.



Volcanologists collect samples.



Mount Tambora from above

## ARTS

### Dark Inspiration

Volcanologists are not the only people inspired by volcanic activity. In 1815, Mount Tambora in Indonesia erupted. This volcano changed the whole planet. Ash clouds covered the sky for more than a year. Crops froze and died. Heavy rain caused floods. Nights seemed darker than normal. One dark, stormy night in Switzerland, author Mary Shelley was inspired. Shelley told her friends a scary story about life and death. They were terrified! That story became the novel *Frankenstein*.



## Blazing the Trail

The Global Volcanism Program (GVP) is made up of a group of volcanologists. The goal of the program is to record volcanic activity on Earth.

The GVP records and shares data from all over the world. Since its founding, the GVP has shared thousands of reports. The GVP also stores all of their volcanic activity reports in an **archive**. That will help future volcanologists.



A fountain of lava erupts from one of the Kamchatka volcanoes in Russia.



## Asking Questions

The GVP has learned a lot from studying volcanoes. They learned that big eruptions happen when volcanoes have not erupted for thousands of years. They also learned about the **frequency** of eruptions. They found that small eruptions happen more often than big eruptions. The GVP learned these things by asking questions and working to find answers.

Volcanoes change the surface of Earth. These changes are measured. Samples of rock and ash are collected. Volcanologists test the samples for **composition**. They want to know what is in a sample of ash.

crater of a volcano



Pumice stone is a type of volcanic rock volcanologists may find.

The word *volcano* comes from *Vulcan*, the name of the Roman god of fire. But, even though volcanoes look like they are releasing flames, volcanoes are never on fire.



# STEAM CHALLENGE

## Define the Problem

Volcanologists from the GVP are still developing methods to better understand volcanoes. In the meantime, how can we make living near an active volcano safer? Your task is to design and build a structure that will keep a cotton ball safe in a model volcanic eruption.



**Constraints:** Your structure must be made using only paper.



**Criteria:** Your paper structure must prevent lava from touching a cotton ball.





## Research and Brainstorm

What are the dangers of living near a volcano? How can you keep people safe? Will you use materials that can withstand the lava or will it alter the flow of lava?



## Design and Build

After making a list of different possibilities, decide which safety measure(s) you will take. Sketch your design, and build a model to test your solutions.



## Test and Improve

Place your structure about 15 centimeters (6 inches) away from a model volcano and then make it erupt. How far did the lava flow? What items did the lava reach? Did your cotton ball stay untouched by lava? What improvements can you make? Modify your design and try again.



## Reflect and Share

How would different types of volcanic eruptions affect your design? Do you think your design could protect from a volcanic eruption? How could your design be improved?