



# Preparing for Volcanoes

## PLEASE NOTE:

Students must complete the “Initiation” section of the **Monster Guard** app before they begin this activity, in order to gain access to the Volcano training mission.



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## Opening

Inform students that they are going to learn about volcanoes and how to stay safe when a volcano erupts. Explain that there are volcanoes all over the world, and that in the United States, the western states, including Alaska and Hawaii, have the most active volcanoes. Ask students to raise their hands if they know what a volcano is. Then ask them if they have ever seen a volcano (even on TV). Assess for prior knowledge by asking students to share what they know about volcanoes.

## Monster Guard

Tell students that will be learning more about volcanoes with a cool app called **Monster Guard**. Explain that **Monster Guard** was created by the American Red Cross as a way for students to have fun learning, practicing, and sharing how to stay safe during different types of emergencies.

Adapt your teaching instructions to the various methods of playing **Monster Guard** – whether you’re using a smart board to play, or having students play in small groups or individually using mobile devices.

Before they begin playing, remind students that they need to watch the videos before and after the training mission for information that will help them complete the classroom activities.

Pass out the activity sheet, read the introduction together, and have students go through the Volcano training mission with Hugo. Remind them to write their score in the space provided on the activity sheet. As a class, have students suggest ways they think they could raise their scores.

## Grades 1-3

**PART 1.** Read the introduction, which explains how volcanoes form. Tell students that, in addition to lava, an erupting volcano can eject large pieces of rock as well as pulverized bits of rock called *volcanic ash*, which may travel hundreds of miles downwind from the volcano. Volcanic ash can also mix with water and dirt to form mudflows – also called *lahars* – which flow downhill, often along rivers and streams, as fast as 40 miles per hour, and can travel as far as 50 miles away from the volcano, knocking down trees and burying anything in their path.

Perform the demonstration to show students how it takes relatively little water mixed with a dry material like volcanic ash to produce a lahar, and how quickly a lahar can move downhill. Afterward, return to Part 1 of the activity and read the description of the three types of volcanoes. Then have students complete Part 1 individually. Review their answers in a class discussion.

### Demonstration

You will need:

- a wide board to represent a mountain slope
- water
- a large glass jar

- a dry material to represent volcanic ash, such as pancake mix, plaster of Paris, or dry spackle. (For a more scientific demonstration, you can prepare a mixture ahead of time that is 1 part driveway gravel, 1 part potting soil, 1.5 parts sand, and .5 parts potters clay powder.)

### Procedure

- Fill the jar about half full of your substitute for volcanic ash.
- Have student volunteers add water a little bit at a time, stirring each time until the “ash” transforms from a clotted mixture into a batter-like “lahar” that flows easily.
- Pour a little of the lahar mixture down a wide, inclined board.
- Adjust the board to a different angle and pour the lahar mixture again.
- Point out how the lahar picks up speed as it flows and how its speed increases as the angle of the board gets steeper.
- Discuss why it is important to head for high ground when escaping a volcano that may be producing lahars. Explain that lahars can follow river and stream beds, or cut their own path as they flow downhill.

**Answer:** A shield volcano, with its gently sloping sides, would produce the slowest-moving lahars.

**PART 2.** Have students work individually to complete this part of the activity. Remind them that they can replay the **Monster Guard** Volcano training mission if they need help. Review the answers in a class discussion.

**Answers:** Long-sleeve shirt, long pants, goggles, dust mask



## Grades 4-6

**PART 1.** Read the introduction, which explains how volcanoes form. Tell students that, in addition to lava, an erupting volcano can eject large pieces of rock as well as pulverized bits of rock called *volcanic ash*, which may travel hundreds of miles downwind from the volcano. Volcanic ash can also mix with water and dirt to form mudflows – also called *lahars* – which flow downhill, often along rivers and streams, as fast as 40 miles per hour, and can travel as far as 50 miles away from the volcano, knocking down trees and burying anything in their path.

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## Teachers:

Please provide feedback on this activity using our online feedback form at [www.ymiclassroom.com/mgfeedback-volcano](http://www.ymiclassroom.com/mgfeedback-volcano).



# Preparing for Volcanoes

Grades 1-3  
Reproducible Master

Hi! I'm Hugo. Volcano eruptions happen all over the world. In the United States, they mostly happen in the western states, including Hawaii and Alaska. Want to learn more? Download **Monster Guard**. It's a free app from the American Red Cross that teaches kids how to be prepared for emergencies. Choose "Volcano" on the main menu to join me on a training mission. You'll learn how to stay safe when a volcano sends ash into the air.

**Note:** You must have completed the **Monster Guard** Initiation section before you can access the Volcano training mission.

My Volcano Safety Score: \_\_\_\_\_



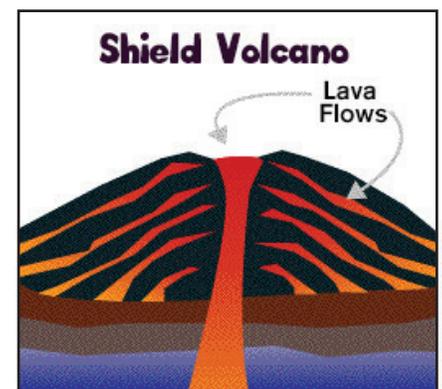
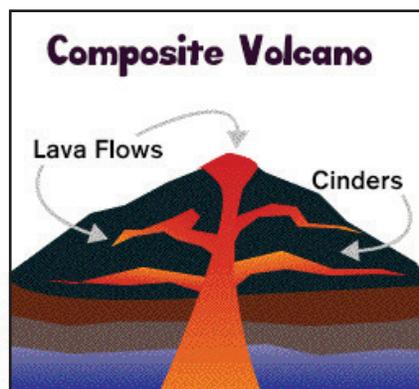
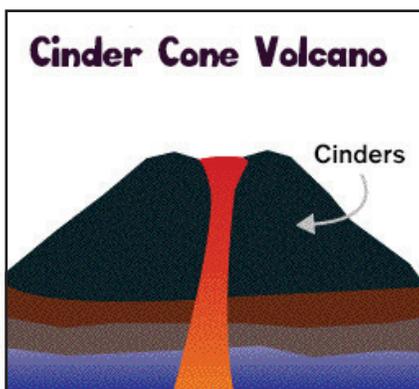
## Part 1

Volcanoes start out as an opening in the ground called a *vent*. Down below the vent, there is hot, melted rock called *magma*. When the magma pushes up through the vent, that's a volcano eruption. Magma is called *lava* once it begins flowing over the Earth's surface. When it finally cools, lava turns into solid rock. As more lava flows and cools into rock, it builds up to form a mountain.

Volcanoes have different shapes depending on how they erupt.

- A *cinder cone volcano* is made by a powerful eruption. It shoots lava high into the air. The lava cools into a kind of rock called *cinder*. This falls to earth and forms a tall mountain with steep, smooth sides.
- A *shield volcano* is made by a slow eruption that sends lava flowing across the ground. Over time, as the lava cools, it forms a low, flat mountain with gently sloping sides.
- A *composite volcano* is created by vents that erupt at different times. This sends lava, ash, hot gases, and chunks of rock into the air. These eruptions form tall mountains with rough, bumpy sides.

You've seen how volcanic ash can turn into a dangerous mudflow, called a *lahar*. Look at the diagrams. Circle the volcano you think would have the slowest-moving lahars if it erupted. Explain your choice in a class discussion.



# Preparing for Volcanoes

Grades 1-3  
Reproducible Master

## Part 2

Do you remember your volcano safety training? Show what you learned!  
Fill in the missing vowels to find out what you should wear to protect yourself from volcanic ash.



l \_ ng-sl \_ \_ v \_ sh \_ rt

l \_ ng p \_ nts

g \_ ggl \_ s

d \_ st m \_ sk



Replay the  
Monster Guard  
Volcano training  
mission. See if you  
can score higher!



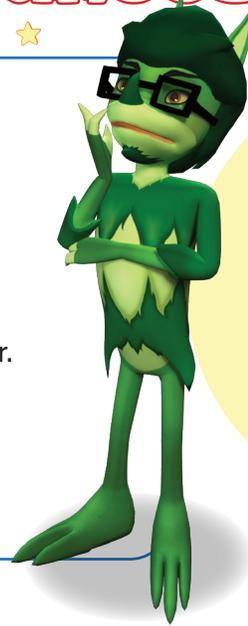
# Preparing for Volcanoes

Grades 4-6  
Reproducible Master

Hi! I'm Hugo. Volcano eruptions happen all over the world. In the United States, they mostly happen in the western states, including Hawaii and Alaska. Want to learn more? Download **Monster Guard**. It's a free app from the American Red Cross that teaches kids how to be prepared for emergencies. Choose "Volcano" on the main menu to join me on a training mission. You'll learn how to stay safe when a volcano sends ash into the air.

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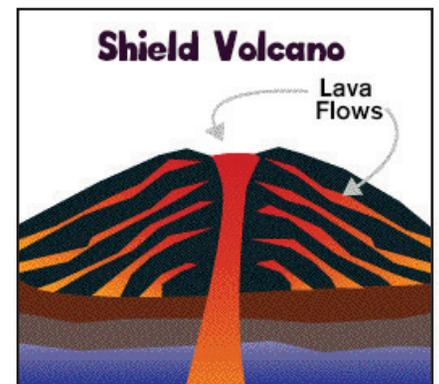
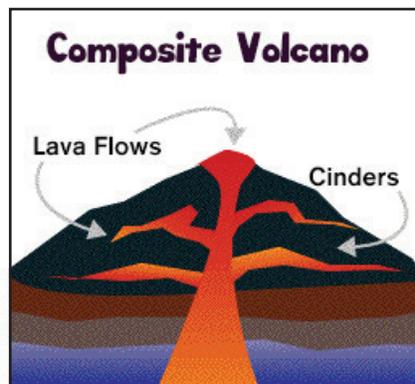
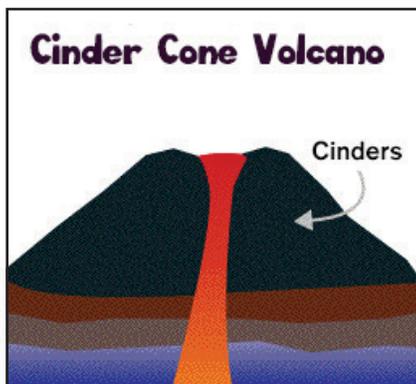
## Part 1

Volcanoes start out as an opening in the ground called a *vent*. Down below the vent, far below the surface of the Earth, there is a region of hot, melted rock called *magma*. When the magma pushes up through the vent, that's a volcano eruption. Magma is called *lava* once it reaches the Earth's surface and begins flowing over the ground. When it finally cools, lava turns into solid rock, which can build up over time to form a mountain. It can also collapse on itself and form a type of crater called a *caldera*.

Volcanoes have different shapes depending on how they erupt.

- A *cinder cone volcano* is made by a powerful eruption. It shoots lava high into the air. The lava cools into a kind of rock called cinder. This falls to earth and forms a tall mountain with steep, smooth sides.
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Reproducible Master

## Part 2

Read the story below, then write on the back of the sheet about what Cassie should do to stay safe during the volcanic eruption.

**C**assie is at home watching TV. It's a sunny afternoon, and she has the windows open to enjoy the warm breeze. Suddenly, she hears on the TV that a nearby volcano has just erupted, spewing ash into the air. The news report says that there is no danger to the people in her city, but they do need to be prepared for ash to fall. Cassie knows she needs to secure the house. She also needs to go outside to get her dog and bring him inside. How should Cassie prepare the house, and what can she do to stay safe while she's outside?



Replay the  
Monster Guard Volcano  
training mission.  
See if you can  
score higher!

