

Oh No! Volcano

Why do volcanic eruptions create such havoc?

Hawaii resident Eleanor Shannon used to grow crops of **protea**. The big, spiky flowers that bloom in brilliant shades of red and orange are popular among U.S. florists.

Then the vog hit and killed the flowers. Vog is volcanic smog, a white, fog-like haze with the odor of a just-struck match. It forms when sulfur dioxide (SO₂) gas belched by a volcano mixes with water vapor and oxygen in the presence of sunlight.

In March 2008, a new vent opened on Kilauea, a volcano in Hawaii. Vog levels took off after that. The toxic haze is hazardous not just to flowers but also to food crops and human health. Vog has been linked to headaches, coughs, sore throats, and irritated eyes.

Ash Clouds

Vog is just one type of volcanic threat. In the spring of 2010, a volcano in Iceland blew its top. Its name is Eyjafjallajökull (ay-yah-FYAH-plah-yer-kuh-duhl).

Iceland is located in the North Atlantic Ocean. Winds blew enormous clouds of ash across Europe. Ash is tiny pieces of rock and glass.

So much ash filled the atmosphere that it became unsafe for airplanes to fly. Ash can damage an airplane's engines. Thousands of flights were canceled.

The ash disrupted flight schedules for several weeks. Experts cannot predict when the volcano will spew ash again.

Hot Rock

Another danger of volcanoes is **lava**—hot, liquid rock. Sometimes it roars down a volcano. Other times it creeps. In either case, it torches everything in its path.

One of history's most famous eruptions destroyed whole cities. Nearly 2,000 years ago, Vesuvius in Italy erupted, and its lava swept across the city of Herculaneum. Many citizens were caught off guard by that eruption. They had no time to escape.

In the neighboring city of Pompeii, people were covered in hot ash from the volcano. When the ash cooled and hardened, their charred bodies turned to dust. That left empty spaces in the rock.

Scientists have filled many of those spaces with plaster to create casts of the long-gone people. The casts reveal how people tried to protect themselves against the volcano's terrible power.

**Scientists cannot accurately predict when a volcano might blow.
How might people who live near a volcano prepare for an eruption?**



Volcanic fog, or vog, killed protea flowers like these in Hawaii.

Danita Delimont/Getty Images



Red-hot lava poured down the side of the Kilauea volcano in Hawaii in March 2008.

Ap Images



Eyjafjallajökull, a volcano on Iceland, spewed ash into the atmosphere in April 2010.

Science Faction/Super Stock



These statues were made by pouring plaster into human-shaped empty spaces in the hardened lava in Pompeii, Italy.

Kaz Mori/Getty Images

Name: _____

Date: _____

1. According to the passage, lava can move
 - A only slowly
 - B in a shower
 - C only quickly
 - D quickly or slowly

2. Which of the following effects of vog on humans is NOT mentioned in the passage?
 - A irritated eyes
 - B throwing up
 - C coughing
 - D sore throats

3. It can be inferred from the passage that if there were a lot of vog, it would be difficult for people
 - A to see
 - B to stay inside
 - C to smell it
 - D to sleep

4. Read this sentence from the passage: "The toxic haze is hazardous not just to flowers but also to food crops and human health."

As used in the passage, **toxic** means
 - A dangerous
 - B foggy and smoky
 - C smelly
 - D filling the air

5. This passage is mostly about
 - A how to predict when a volcano will erupt
 - B what to do if your flight is canceled
 - C the dangerous effects of volcanic eruptions
 - D the Icelandic volcano eruption in 2010

6. Summarize the three dangers of volcanic eruptions that can cause damage. Be sure to use evidence from the text to support your answer.

7. Why were citizens in the city of Herculaneum unprepared for the eruption of Vesuvius? Be sure to clearly state your reasoning and provide evidence from the text to support your answer.

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

Clouds of ash filled the air when a volcano in Iceland erupted, _____ thousands of flights were canceled.

- A but
- B because
- C so
- D after

9. Answer the following questions based on the sentence below.

Ash clouds can cause flights to be canceled when volcanoes erupt because the ash can damage a plane's engines.

What? ash clouds

(can) What? _____

When? _____

Why? _____

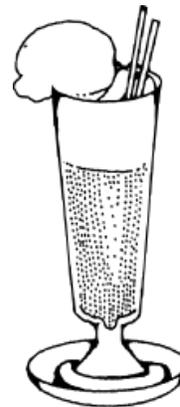
10. Read the vocabulary word and definition below, and complete questions 10a, 10b, and 11.

Vocabulary Word: toxic (tox · ic): poisonous or harmful to living things.

10a. Read the sentences below and underline the word **toxic**.

1. Vog smoke can be toxic to plants and humans, killing flowers and causing headaches in humans.
2. Breathing in too much smoke can be toxic for a person’s lungs and makes it hard to breathe.
3. Be careful when choosing plants to eat in the wild because some are toxic and can make you sick.
4. Some spider bites are toxic because they release poisons that make humans sick.
5. There are many different cleaning products that are toxic, so make sure you keep them away from small children, who might accidentally swallow them.

10b. Which item would you most likely avoid because it could be toxic?



11. Why is it important for parents to keep toxic items out of the reach of children?

Teacher Guide & Answers

Passage Reading Level: Lexile 870

Featured Text Structure: Cause/Effect – the writer presents the reason an event happened and its results

Passage Summary: This passage discusses three effects of volcanic eruptions and their threat to humans and cities.

1. According to the passage, lava can move

- A only slowly
- B in a shower
- C only quickly
- D **quickly or slowly**

2. Which of the following effects of vog on humans is NOT mentioned in the passage?

- A irritated eyes
- B **throwing up**
- C coughing
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3. It can be inferred from the passage that if there were a lot of vog, it would be difficult for people

- A **to see**
- B to stay inside
- C to smell it
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4. Read this sentence from the passage: "The toxic haze is hazardous not just to flowers but also to food crops and human health."

As used in the passage, **toxic** means

- A **dangerous**
- B foggy and smoky
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- D filling the air

5. This passage is mostly about

- A how to predict when a volcano will erupt
- B what to do if your flight is canceled
- C **the dangerous effects of volcanic eruptions**
- D the Icelandic volcano eruption in 2010

6. Summarize the three dangers of volcanic eruptions that can cause damage. Be sure to use evidence from the text to support your answer.

Suggested answer: The three dangers are vog (volcanic smog), ash clouds, and lava. The article states that vog is toxic smog that can kill crops, flowers, and affect human health. Ash clouds are made of tiny rock and glass that can damage airplane engines, so ash can cause flight delays. Lastly, lava torches everything in its path because it is hot, liquid rock. [paragraphs 2, 5, 8]

7. Why were citizens in the city of Herculaneum unprepared for the eruption of Vesuvius? Be sure to clearly state your reasoning and provide evidence from the text to support your answer.

Suggested answer: The article states that experts even today cannot accurately predict when a volcano might blow. Therefore, it is unlikely that 2,000 years ago the citizens of Herculaneum could have been prepared, because they would have been unable to predict when the volcano would erupt. [paragraphs 9 and 12]

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

Clouds of ash filled the air when a volcano in Iceland erupted, _____ thousands of flights were canceled.

- A but
- B because
- C so
- D after

9. Answer the following questions based on the sentence below.

Ash clouds can cause flights to be canceled when volcanoes erupt because the ash can damage a plane's engines.

What? ash clouds

(can) What? **cause flights to be canceled**

When? **when volcanoes erupt**

Why? **because the ash can damage a plane's engines**

10. ReadWorks recommends that you teach this vocabulary word to the whole class out loud using the four steps listed below.

Vocabulary Word: toxic

Step 1: Introduce the word

- a. Teacher writes the word on the board and divides it into syllables: (tox · ic)
- b. Teacher says: "This word is toxic. What is the word?" [All students reply together out loud: "toxic."]

Step 2: Provide a child-friendly definition

- a. Teacher says: "Toxic means something is poisonous or harmful to living things. Something toxic could make you feel sick or kill you."
- b. Teacher says: "In the passage, the vog smoke was toxic to human health because it could cause coughing, headaches, and sore throats. There are a lot of chemicals that are toxic, so you need to read labels carefully."

c. Teacher says: "What is the word?" [All students reply together out loud: "toxic."]

Step 3: Practice the word

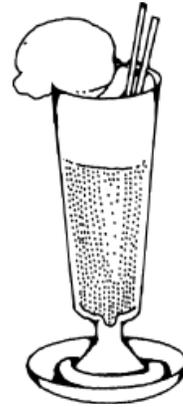
Teacher provides examples and additional opportunities to repeat the word. Read the first sentence out loud to your students. Begin reading it again and when you come to the vocabulary word, prompt students to say the vocabulary word out loud. Then, finish reading the sentence out loud to your students.

- 10a.**
1. Smoke can be toxic to plants and humans, killing flowers and causing headaches in humans.
 2. Breathing in too much smoke can be toxic for a person's lungs and makes it hard to breathe.
 3. Be careful when choosing plants to eat in the wild because some are toxic and can make you sick.
 4. Some spider bites are toxic because they release poisons that make humans sick.
 5. There are many different cleaning products that are toxic, so make sure you keep them away from small children, who might accidentally swallow them.

Step 4: Check for student understanding

This step can be completed as a whole class activity or as an independent practice.

10b. Which item would you most likely avoid because it could be toxic?



11. Why is it important for parents to keep toxic items out of the reach of children?

Suggested answer: Children may try to eat or drink these items, which would make them sick.

Suggested Additional Vocabulary: havoc, hazardous, atmosphere, disrupted, creeps