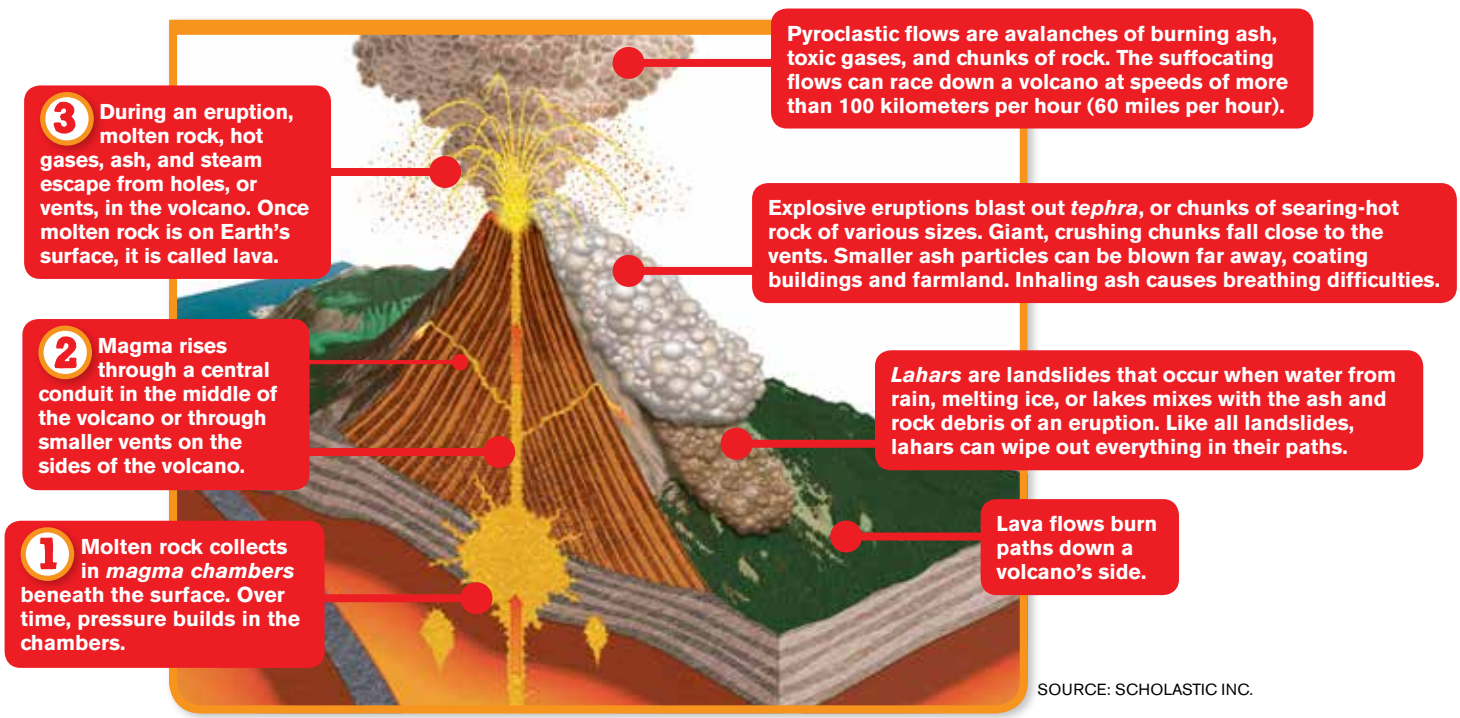
Name: _____

INSIDE A VOLCANO

In "Inside Pompeii's Victims" (p. 14), you read about the volcanic eruption that buried Pompeii in 79 A.D. The diagram below shows how a volcano erupts and the hazards that result. Use the diagram to answer the questions that follow.



SOURCE: SCHOLASTIC INC.

QUESTIONS

1. What is a magma chamber?

2. In your own words, explain how a volcano erupts.

3. What is the difference between magma and lava?

4. Suppose a volcano had a glacier (ice sheet) on its side when it erupted. What hazard might result? Explain your answer.

5. Consider what you learned in "Inside Pompeii's Victims." Which volcanic hazard shown on the diagram buried the town of Pompeii? Describe the hazard and why it is so deadly.

Name: _____

DEADLY ERUPTIONS

In "Inside Pompeii's Victims" (p. 14), you learned how scientists are studying the victims of one of the deadliest known volcanic eruptions. The chart below shows the top-five deadliest eruptions in history. Use the data in the chart to answer the questions that follow.

Top-Five Deadliest Known Volcanic Eruptions

Volcano	Year	Deaths	Major causes of death
Tambora, Indonesia	1815	92,000	An estimated 10,000 people died instantly in the eruption. About 80,000 more died from starvation because of the smothering impact of volcanic ash falling on water sources, farmlands, and forests.
Krakatau, Indonesia	1883	36,417	The giant eruption on this ocean island caused a tsunami to form. The giant sea waves killed people on coasts surrounding the volcano in the Indian Ocean.
Mount Pelee, Martinique	1902	29,025	After a number of smaller events in the days prior, Mount Pelee erupted explosively on May 8, 1902. A giant speeding mass of hot gases and rock destroyed the nearby town of St. Pierre. The pyroclastic flow killed nearly all of the town's residents.
Ruiz, Colombia	1985	25,000	The eruptions caused massive lahars, landslides made of a mixture of water and volcanic debris, that raced down the volcano's side and leveled nearby towns.
Unzen, Japan	1792	14,300	The eruption triggered a landslide that swept through nearby towns. The landslide struck the ocean, causing a tsunami that killed people on surrounding coasts.

SOURCE: VOLCANO.OREGONSTATE.EDU

GRAPH IT: On a separate piece of paper, use the data in the chart to create a bar graph showing the number of deaths caused by each eruption. Don't forget to label your graph and give it a title.

QUESTIONS

1. How many of the eruptions occurred in the 1800s?

2. Which volcanoes resulted in deadly tsunamis?

3. Why did most of the people in the deadliest known eruption die?

4. On which continent is the volcano located that caused deadly lahars?

5. Consider what you learned about what caused the deaths in Pompeii. Which eruption is most similar to that of Mount Vesuvius? Explain your answer.

Name: _____

EXPLOSIVE MIX

In "Inside Pompeii's Victims" (p. 14), you learned how an explosive volcanic eruption destroyed the town of Pompeii. In this passage, you'll learn more about how the chemical composition of magma in a volcano affects its type of eruption. Read the passage and then use complete sentences to answer the questions that follow.

GASSY ERUPTIONS

No two volcanoes erupt in the same way. When Kilauea, a volcano in Hawaii, erupts, red hot molten *lava* oozes slowly down its slopes. Eruptions on Mount St. Helens in Oregon, on the other hand, have been violent explosions of ash, gas, and debris that have flattened trees miles away.

Whether lava flows out gently or the mountain blows its top depends on the mix of materials in the *magma* inside the volcano. The molten rock stored in a volcano contains gases such as water vapor and carbon dioxide. Deep below earth's crust, these gases are dissolved into magma. As the molten rock rises to the surface, the gases expand and separate from the mix to form bubbles. *Explosive eruptions* occur from magma that contains lots of bubbles. As with a shaken soda can that sprays when it's opened, the bubbles cause lava and ash to shoot into the sky.

The chemical composition of the magma affected the amount of gases it contains. Magma with high concentrations of the elements potassium and sodium typically have higher gas contents. Magma rich in iron and magnesium, such as those found in Hawaii, usually have lower gas contents and result in gentle *effusive eruptions*.

QUESTIONS

1. What is the author's purpose in writing the passage?

2. Use your own words to describe what happens to the gas in magma as it rises toward the surface.

3. What is an effusive eruption?

4. Describe the likely chemical composition of the magma in Mount St. Helens. Explain your answer.

5. Consider what you learned about the eruption of Mount Vesuvius in "Inside Pompeii's Victims." What type of magma do you think the volcano contains? Support you answer with evidence from the texts.

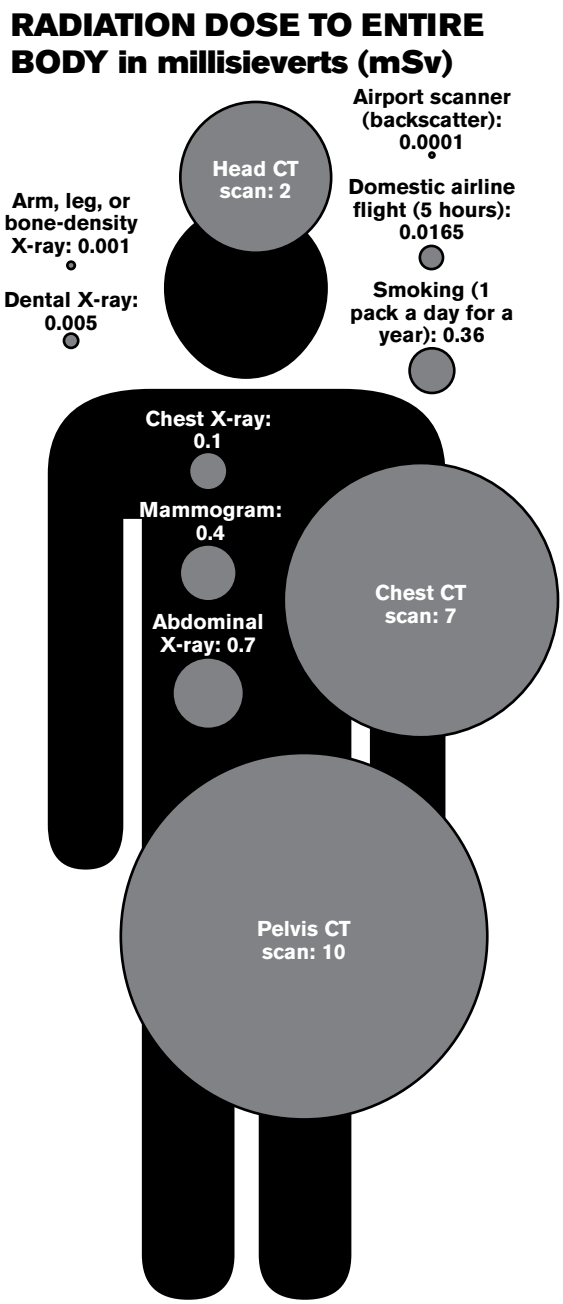
Name: _____

ENERGY EXPOSURE

In "Inside Pompeii's Victims" (p. 14), you read about how scientists used CT scanners to study the remains of victims of a volcanic eruption. This imaging technique is usually used to help diagnose medical conditions in living people.

CT scanners and other medical devices can help detect tumors or broken bones, but they also expose patients to invisible high-energy waves and particles. Too much exposure to this *radiation* can be harmful.

The diagram on the right shows the radiation doses emitted during certain medical procedures. Radiation exposure is measured in millisieverts (mSv). Study the pictograph, then answer the questions that follow.



QUESTIONS

1. Do X-rays or CT scans expose patients to a higher radiation dose?

2. Radiation occurs naturally in the environment. The average person's exposure from natural sources is roughly 3 mSv per year. Suppose a person's annual radiation exposure was 5 mSv. What percentage of their total exposure was due to sources other than natural ones?

3. Suppose a pack-a-day smoker decided to quit. How much lower would his or her radiation exposure be over the next 20 years?

4. Some people work in fields in which they are exposed to more radiation than the average person, such as nuclear energy. It is recommended that these people do not exceed work exposures of more than an average of 20 mSv per year. How many chest X-rays would a person have to have to equal that annual dose?

5. Use your own words and the information in the diagram to explain why doctors should consider carefully if patients should undergo medical imaging tests. What factors might they consider?