

VOLCANOES UNIT STUDY WORKBOOK

Five ready-to-use activities generated through HomeTrail's Nest pack system for a fourth-grade learner. Print the pages you need and use the separate audio episode alongside the workbook.

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Deep Dive

Volcano Detectives: How Scientists Study Eruptions

Volcanoes can be quiet for a long time and then become active. Scientists study their past and present activity to learn about hazards and help communities prepare. In this guide, you will examine what the provided research shows about volcanoes, eruptions, volcano shapes, and scientific evidence.

Volcanoes Change Over Time

Scientists learn about volcanoes by studying their geologic record, including geologic maps and information about past eruptions. The Smithsonian Global Volcanism Program keeps records of volcanoes and eruptions from the past 12,000 years. These records help scientists understand how a volcano has behaved over time and what it might do in the future.

What an Eruption Can Include

An eruption does not always look the same. Reports in the Global Volcanism Program describe ash plumes, lava flows, explosions, gas and steam emissions, and glowing pieces of volcanic material. Some eruptions also produce lahars, which are debris flows, or dangerous fast-moving mixtures of water and volcanic material. Scientists record these details because each one gives clues about volcanic activity.

Why Scientists Watch Volcanoes

The research shows that scientists monitor eruptions and study hazards so people can prepare and stay safer. They use eruption reports, geologic maps, databases, and hazard assessments. They also work with emergency managers and communities to create response plans. The provided sources do not explain the underground physical cause of eruptions or give names for major volcano shapes, so those details are left for another lesson.

Remember these

- A volcano's past activity is recorded in geologic maps, databases, and scientific reports.
- Eruptions may include ash, lava, explosions, gases, steam, or glowing volcanic material.
- Some volcanic hazards include lahars, landslides, and pyroclastic flows.
- Scientists use evidence about past and present activity to make hazard assessments.
- Sharing information and planning with communities can reduce volcanic risks.

Try this

Choose one volcano from the Smithsonian Global Volcanism Program. Look at its reports or activity record. Make a two-column chart labeled Evidence and What It Shows. For example, you

might list ashfall as evidence that helps describe an eruption. Then discuss how this information could help a nearby community prepare.

Think about it

If you were a volcano scientist, which kind of evidence would you want to study first, and how might it help people prepare?

Sources

- [Education | U.S. Geological Survey](http://www.usgs.gov)www.usgs.gov
- [Smithsonian Institution - Global Volcanism Program: Worldwide Holocene Volcano and Eruption Information](http://volcano.si.edu)volcano.si.edu



Volcanoes, Earth Layers, and Tectonic Plates Quiz

Instructions: Read each question carefully and select the best answer. When you're ready, tap Submit to see your results.

0 of 10 answered

1. What is the difference between magma and lava?

- ☐ A. Magma is cold rock, and lava is hot water
- ☐ B. Magma is melted rock below Earth's surface, and lava is melted rock at or above the surface
- ☐ C. Magma and lava are two different names for soil
- ☐ D. Magma is found only in oceans, and lava is found only on mountains

2. Which layer of Earth is the thin, solid outer layer where we live?

- ☐ A. The crust
- ☐ B. The inner core
- ☐ C. The outer core
- ☐ D. The mantle

3. Which observation would be the strongest evidence that a volcano erupted in the past?

- ☐ A. A layer of hardened lava and ash near the volcano
- ☐ B. Trees growing on a nearby hill
- ☐ C. A river flowing far from the volcano
- ☐ D. A cloudy sky above the volcano

4. Which volcano shape is usually broad with gentle, sloping sides because it is built by runny lava?

- ☐ A. Cinder cone
- ☐ B. Stratovolcano

☐ C. Volcanic plug

☐ D. Shield volcano

5. What happens when two tectonic plates push toward each other and one plate moves beneath the other?

☐ A. Both plates always disappear into outer space

☐ B. The plates stop moving forever

☐ C. The sinking plate can melt deeper underground and help form volcanoes

☐ D. A new ocean always forms between the plates

6. Why can a volcano erupt when pressure builds up underground?

☐ A. Pressure makes Earth's crust turn into clouds

☐ B. Pressure causes the volcano to become completely empty

☐ C. Pressure can push magma and gases through cracks toward the surface

☐ D. Pressure freezes all the rocks inside the volcano

7. Which Earth layer is mostly solid rock but can slowly flow over very long periods of time?

☐ A. The atmosphere

☐ B. The crust

☐ C. The inner core

☐ D. The mantle

8. Lava is called magma after it cools and hardens on Earth's surface.

☐ True

☐ False

9. Tectonic plates are large pieces of Earth's crust and uppermost mantle that move slowly.

☐ True

☐ False

10. A cinder cone volcano is usually made from small pieces of rock and ash that fall around a vent.

☐ True

☐ False

Word Search: volcanoes, magma, lava, Earth layers, eruptions, and tectonic plates

Explore the fiery forces beneath Earth’s surface with words about volcanoes, layers, eruptions, and moving tectonic plates.

12 words left to find.

E	Q	F	P	Y	R	M	R	Y	L	K	F
R	K	G	N	A	A	C	P	D	A	S	M
U	K	I	S	N	T	L	R	M	V	I	P
P	K	H	T	V	A	R	Q	A	A	L	P
T	C	L	G	T	I	V	E	G	T	U	P
I	E	R	E	J	W	O	O	M	T	E	T
O	A	S	U	R	N	L	C	A	O	V	R
N	H	K	M	S	J	C	V	I	I	R	X
G	R	W	V	A	T	A	Z	C	D	W	P
Y	Z	E	B	T	A	N	A	A	T	H	N
W	N	W	G	K	S	O	F	P	R	P	P
T	G	G	C	B	Q	C	O	R	E	C	D

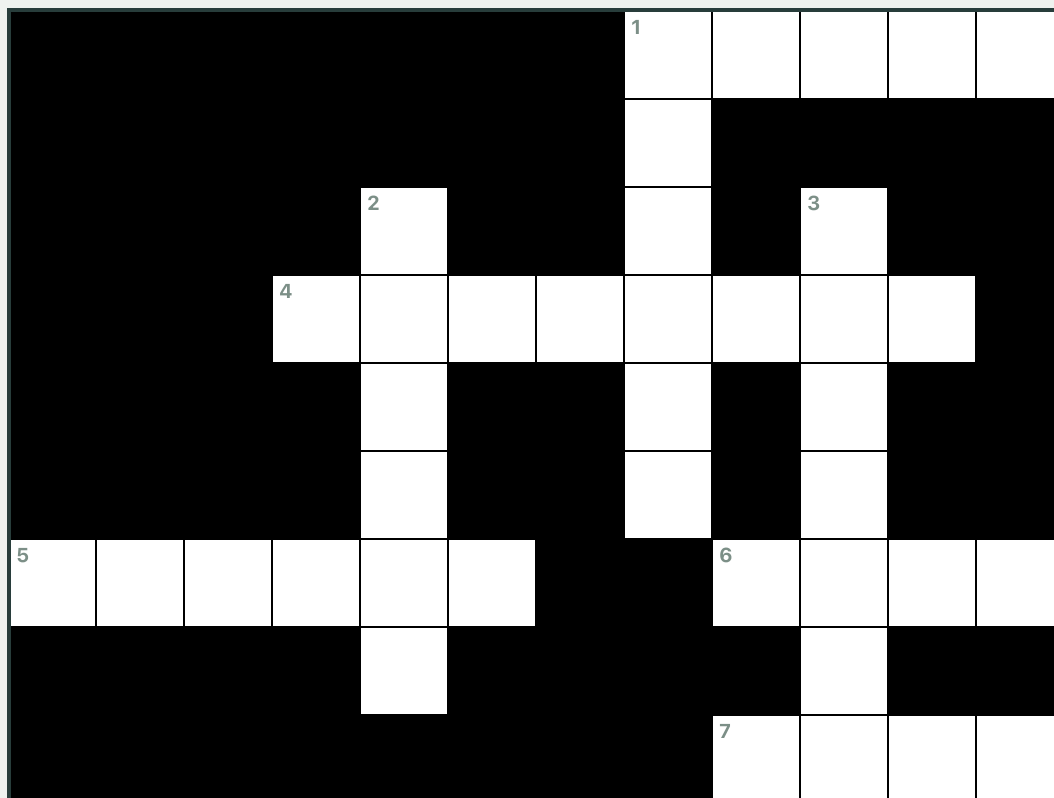
Find these words:

- ERUPTION
- VOLCANO
- MANTLE
- PLATES
- CRATER
- TREMOR
- MAGMA
- CRUST
- LAVA
- CORE
- VENT
- ASH

Volcanoes and Earth Layers Crossword

Instructions: Tap a clue, then fill each box with one letter. Tap again to switch between Across and Down.

8 clues left.



ACROSS

1. Hot, melted rock found beneath Earth's surface.
4. An event in which a volcano releases lava, ash, and gases.
5. Huge pieces of Earth's crust that slowly move over the mantle.
6. Hot, melted rock that flows on Earth's surface.
7. The very hot, deepest layer at the center of Earth.

DOWN

1. The thick, hot layer of Earth between the crust and the core.
2. A bowl-shaped hole at the top of many volcanoes.
3. An opening or mountain where melted rock and gases can reach Earth's surface.

