

Plates in Motion

Trace how slow plate movement produces dramatic surface changes.

SC.7.E.6.5 "Explore the scientific theory of plate tectonics by describing how the movement of Earth's crustal plates causes both slow and rapid changes in Earth's surface, including volcanic eruptions, earthquakes, and mountain building."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline words or phrases that show plate movement, circle each change to Earth's surface, and write 1 by slow changes and 2 by rapid changes. This will help you connect plate motion to its effects.

Earth's Moving Surface

- ① Earth's outer shell is broken into huge pieces called tectonic plates. These plates include crust and the rigid uppermost mantle. They move slowly, often only a few centimeters each year, because heat inside Earth helps drive motion in the softer layer below. A plate can carry ocean floor, continent, or both. Although people cannot feel this creeping motion from day to day, plates constantly change the shape of Earth's surface where they meet. Their boundaries are places where evidence of change is easiest to find.
- ② At some boundaries, plates pull apart. Magma rises into the gap, cools, and forms new crust. Under the ocean, this slow process can build long ridges. At other boundaries, plates collide. When two continents push together, their crust crumples and thickens, lifting mountain ranges over millions of years. When an oceanic plate sinks beneath another plate, rock melts and magma may rise. Repeated eruptions can build volcanoes, changing the surface both suddenly and over long periods.
- ③ Plates can also slide past each other along faults. Friction may lock the rocks while the plates keep moving. Stress then builds in the crust. If the rocks suddenly break or slip, stored energy travels as seismic waves, causing an earthquake. This rapid change can shake the ground in seconds. Volcanic eruptions are also rapid when magma, gas, and ash reach the surface. Plate motion is slow, but it supplies the stress and magma that lead to these dramatic events.

2 ANSWER WITH EVIDENCE Use the passage

1 How can plates pulling apart cause a slow change in Earth's surface?

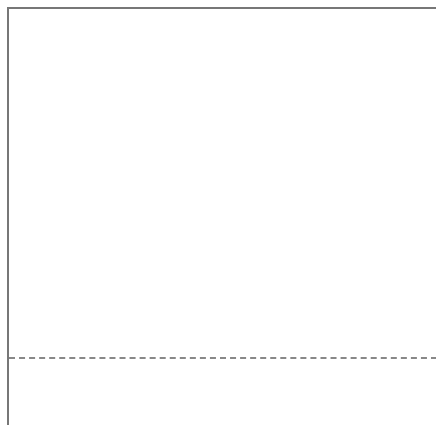
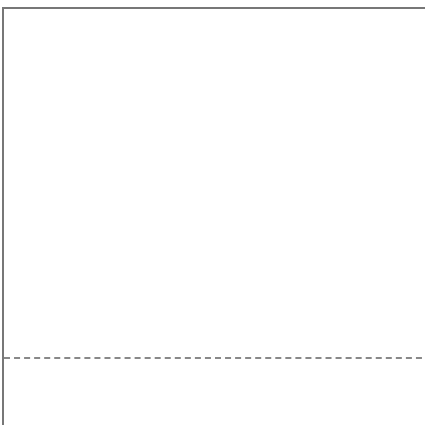
2 Describe how two colliding continental plates build mountains.

3 Explain the chain of events that causes an earthquake where plates slide past each other.

4 Why can a volcanic eruption be rapid even though plate motion is slow?

3 YOUR TURN Your own words

Create a three-panel labeled sketch of an oceanic plate sinking beneath another plate. Show the slow plate movement in panel 1, magma forming or rising in panel 2, and a volcanic eruption changing the surface in panel 3.

		
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PART 1 • READ AND MARK

Underline words or phrases that show plate movement, circle each change to Earth's surface, and write 1 by slow changes and 2 by rapid changes. This will help you connect plate motion to its effects. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How can plates pulling apart cause a slow change in Earth's surface?	Magma rises into the gap, cools, and forms new crust. Under the ocean, this can slowly build long ridges.
2	Describe how two colliding continental plates build mountains.	The continents push together, so their crust crumples and thickens. This lifts mountain ranges over millions of years.
3	Explain the chain of events that causes an earthquake where plates slide past each other.	Friction can lock rocks while plates continue moving, so stress builds. When rocks suddenly break or slip, stored energy travels as seismic waves and causes an earthquake.
4	Why can a volcanic eruption be rapid even though plate motion is slow?	Slow plate motion can produce magma over time. An eruption is rapid when magma, gas, and ash reach the surface.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: An oceanic plate moves slowly beneath another plate, with arrows showing its direction. Panel 2: Rock melts and magma rises toward the surface. Panel 3: A volcano erupts with magma, gas, and ash reaching the surface.

Accept equivalent descriptions that correctly connect slow plate motion at a subduction boundary to magma and a rapid volcanic eruption. In the sketch, look for labeled plate movement, rising magma, and an eruption in the correct sequence.