

Slow Motion, Sudden Change

Trace how plate motion builds and releases energy.

S6E5.f "Construct an explanation of how the movement of lithospheric plates, called plate tectonics, can cause major geologic events such as earthquakes and volcanic eruptions."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each phrase that tells how plates move, circle each phrase that names an earthquake or volcanic eruption, and number the three boundary types 1 through 3. This will help you trace how movement causes geologic events.

Slow Motion, Sudden Events

- ① Earth's rigid outer shell is broken into huge pieces called lithospheric plates. These plates rest on a warmer, slowly flowing layer below them. Heat from inside Earth helps drive their movement, usually only a few centimeters each year. A plate boundary is the place where plates meet. Although the movement is slow, the pressure it creates can build for a long time. When plates push, pull apart, or slide past each other, Earth's crust can change suddenly.
- ② At a convergent boundary, plates move toward one another. One oceanic plate may bend and sink beneath another plate. As the sinking plate moves deeper, it releases water that helps nearby rock melt. Melted rock, called magma, can rise through cracks. If magma reaches the surface, it erupts as lava and may build a volcano. Strong pressure also bends and breaks rock near the boundary. A sudden break can send out energy as an earthquake, even when no volcano forms.
- ③ At a divergent boundary, plates move apart. Magma can rise into the opening, cool, and make new crust. This process can cause volcanic eruptions and small earthquakes. At a transform boundary, plates slide sideways. Their rough edges may lock instead of moving smoothly. Stress builds until the rocks suddenly slip. The released energy travels through the ground as an earthquake. Scientists use the pattern of plate movement and the boundary type to explain why earthquakes and eruptions happen in different places.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 How can plates that move slowly cause an earthquake at a transform boundary?

2 Explain how a sinking oceanic plate at a convergent boundary can lead to a volcanic eruption.

3 What can happen as plates pull apart at a divergent boundary, and how does new crust form?

4 A convergent boundary has an earthquake but no volcano. What process described in the passage could have caused the earthquake?

3 YOUR TURN _____ Your own words

Write a six-sentence explanation that compares a transform-boundary earthquake with a convergent-boundary volcanic eruption. Include the plate movement, what builds or changes below ground, and the event that results.

PART 1 • READ AND MARK

Underline each phrase that tells how plates move, circle each phrase that names an earthquake or volcanic eruption, and number the three boundary types 1 through 3. This will help you trace how movement causes geologic events. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How can plates that move slowly cause an earthquake at a transform boundary?	The rough plate edges can lock while the plates try to slide. Stress builds until the rocks suddenly slip and release energy as an earthquake.
2	Explain how a sinking oceanic plate at a convergent boundary can lead to a volcanic eruption.	The sinking plate releases water that helps nearby rock melt into magma. The magma can rise and erupt as lava if it reaches the surface.
3	What can happen as plates pull apart at a divergent boundary, and how does new crust form?	Magma can rise into the opening, cool, and form new crust. Volcanic eruptions and small earthquakes can also occur.
4	A convergent boundary has an earthquake but no volcano. What process described in the passage could have caused the earthquake?	Strong pressure can bend and break rock near the boundary. A sudden break releases energy as an earthquake.

PART 3 • YOUR TURN (SAMPLE ANSWER)

At a transform boundary, two plates slide sideways past each other. Their rough edges can lock, so stress builds in the rocks. When the rocks slip, energy is released as an earthquake. At a convergent boundary, an oceanic plate can sink beneath another plate. Water from the sinking plate helps nearby rock melt into magma. The magma can rise and erupt as lava, forming a volcano.

Accept explanations that correctly connect a boundary's plate movement to stress, rock breaking, melting, or rising magma and then to an earthquake or eruption. For the open response, accept equivalent accurate vocabulary and a clear comparison of the two cause-and-effect chains.