Plates in Motion

Trace how moving plates change Earth's surface

6.6.b "Construct a scientific explanation of how the movement of lithospheric plates can cause major geologic events and form Earth's surface features, including convergent, divergent, and transform boundaries; earthquakes; and volcanoes."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline phrases that tell how plates move, circle the features and events that result, and draw an arrow from each plate movement to one effect it causes.

Three Stops on the Seafloor

1. Imagine riding a research ship across the ocean floor. Beneath the ship, Earth's rigid outer layer is broken into huge pieces called lithospheric plates. At a mid-ocean ridge, two plates move away from each other. Hot rock rises from below and partly melts. The melted rock, called magma, reaches the seafloor and cools, building new ocean crust. Repeated eruptions add rock to the ridge. As the plates pull apart, the rock can crack and slip, causing earthquakes. This boundary is called divergent.

2. Later, the ship nears a steep coast. Here an oceanic plate and a continental plate move toward each other at a convergent boundary. The denser oceanic plate sinks beneath the continental plate, forming a deep trench offshore. As the sinking plate moves downward, some rock above it melts. Magma can rise through the continent and erupt from volcanoes, building mountains. The plates can also become stuck. Pressure builds as they keep moving, then the rocks suddenly slip. That sudden movement sends out energy as an earthquake.

3. At the last stop, instruments detect two plates sliding sideways past one another. This is a transform boundary. Their edges may catch on each other even while the plates keep moving. When the stuck edges suddenly slip, the ground shakes in an earthquake. Unlike the other two stops, sliding sideways does not normally make new crust or sink one plate beneath another. A transform boundary can leave a long fracture, called a fault, across Earth's surface. Plate motion explains the different patterns of events at these three stops.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does plate movement at the mid-ocean ridge build new ocean crust?

2. How does plate movement near the steep coast cause both a trench and volcanoes?

3. Why can plates sliding past one another cause an earthquake?

4. Magma reaches the surface at both the ridge and the coast. How does plate movement lead to melting at each place?

3 YOUR TURN

Your own words

Write a four- or five-sentence field report about two imaginary sites on Earth with different plate boundaries. For each site, describe plate motion and explain how it causes one surface feature and one geologic event.

ANSWER KEY

Plates in Motion

GRADE 6 · 6.6.b

PART 1 · READ AND MARK

Underline phrases that tell how plates move, circle the features and events that result, and draw an arrow from each plate movement to one effect it causes. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does plate movement at the mid-ocean ridge build new ocean crust?	**The plates move apart. Magma rises between them and cools on the seafloor, building new ocean crust.**
2	How does plate movement near the steep coast cause both a trench and volcanoes?	**The denser oceanic plate sinks beneath the continental plate, forming a trench. Rock above the sinking plate melts, and rising magma can erupt from volcanoes.**
3	Why can plates sliding past one another cause an earthquake?	**The plate edges can catch while the plates keep moving. When the stuck edges suddenly slip, the ground shakes.**
4	Magma reaches the surface at both the ridge and the coast. How does plate movement lead to melting at each place?	**At the ridge, plates move apart and hot rock rises and partly melts. At the coast, an oceanic plate sinks beneath a continental plate, and some rock above it melts.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

At Lantern Deep, two oceanic plates move apart at a divergent boundary, and new crust builds a ridge between them. Magma rises where the plates separate and erupts onto the seafloor. At Cedar Plain, two plates slide sideways past one another at a transform boundary, leaving a fault across the ground. Their edges catch and then suddenly slip, causing an earthquake.

Accept other scientifically accurate cause-and-effect explanations supported by the passage. In the field report, each imaginary site should have a different boundary type, a feature, and a geologic event linked to plate motion.