

Moving Earth Systems

Trace how moving plates reshape Earth's surface.

7.10.B "describe how plate tectonics causes ocean basin formation, earthquakes, mountain building, and volcanic eruptions, including supervolcanoes and hot spots."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline words that describe plate or mantle movement, and circle each result on Earth's surface. Draw a line from each movement to the result it causes when you can.

Earth's Changing Surface

- ① Earth's outer shell is broken into moving tectonic plates. At a divergent boundary, two plates pull apart. Hot material from the mantle rises into the opening and cools to make new crust. This process can stretch and crack a continent, forming a rift valley. If spreading continues, the rift widens, drops below sea level, and fills with water. New ocean crust forms along the middle of the growing basin, pushing the plates farther apart over millions of years.
- ② When plates move toward each other at a convergent boundary, their collision changes Earth's surface. Two continental plates can crumple and thicken, slowly building high mountain ranges. When one plate suddenly slips along a fault, stored energy is released as an earthquake. At some convergent boundaries, a denser oceanic plate sinks beneath another plate in subduction. Rock above the sinking plate may melt. Magma can rise through the crust and erupt from volcanoes at the surface.
- ③ Not every volcano forms at a plate boundary. A hot spot is a long-lived area where unusually hot mantle material rises, melts through a moving plate, and creates volcanoes. As the plate moves, a chain of volcanoes may form, with the youngest above the hot spot. A supervolcano can erupt when a very large magma reservoir releases magma explosively, often leaving a wide collapsed depression called a caldera. Its eruption can spread ash over a huge region, but it is not simply any large volcano.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 How can a divergent boundary grow into an ocean basin? Describe the steps in order.

2 What plate action builds mountains, and what plate action causes an earthquake?

3 Explain how subduction can lead to a volcanic eruption.

4 How is a hot spot different from a supervolcano?

3 YOUR TURN _____ Your own words

Invent a 4- or 5-sentence description of a place at one plate setting from the passage. Name the setting, explain how material moves, and describe two results that could happen there.

PART 1 • READ AND MARK

Underline words that describe plate or mantle movement, and circle each result on Earth's surface. Draw a line from each movement to the result it causes when you can. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How can a divergent boundary grow into an ocean basin? Describe the steps in order.	Plates pull apart, mantle material rises and cools into new crust, and a rift valley widens. If it drops below sea level, water fills it while new ocean crust continues forming.
2	What plate action builds mountains, and what plate action causes an earthquake?	Two continental plates colliding can crumple and thicken crust into mountains. Sudden slipping along a fault releases stored energy as an earthquake.
3	Explain how subduction can lead to a volcanic eruption.	A denser oceanic plate sinks beneath another plate. Rock above the sinking plate may melt, and the magma can rise through the crust and erupt.
4	How is a hot spot different from a supervolcano?	A hot spot is a long-lived area of rising hot mantle material that can create volcanoes through a moving plate. A supervolcano has a very large magma reservoir and can erupt explosively, often leaving a caldera.

PART 3 • YOUR TURN (SAMPLE ANSWER)

On an imaginary coast, an oceanic plate moves beneath a continental plate. The sinking plate causes rock above it to melt, and magma rises toward the surface. A volcano can erupt near the coast. Stress builds where the plates meet, so sudden slipping can cause earthquakes. This place may have both volcanic eruptions and earthquakes because of subduction.

Accept equivalent accurate descriptions of the cause-and-effect relationships in the passage. For the open response, accept any passage-based plate setting if the student correctly explains movement and two connected results.