

NAME _____ Class period _____

PLATE TECTONICS

Hot Spots

Most geologic activity takes place at tectonic plate boundaries. But some activity does not. Instead, it occurs within plates. This is called intraplate activity. Much intraplate activity is found at hot spots. A hot spot is a fixed location where magma rises up through the crust.

As an oceanic plate moves over a hot spot, it forms a chain of volcanoes. If the volcanoes are large enough, they form a chain of volcanic islands. This is how the Hawaiian Islands formed. Why does a chain of volcanic islands—rather than just a single volcanic island—form over a hot spot? At a hot spot, magma erupts through the plate, forming a volcanic island. Because the plate is moving, the volcanic island gradually moves away from the hotspot. Then magma erupts at the hot spot again, forming a new volcanic island. As the plate continues to move over the hot spot, a chain of volcanic islands forms. The youngest island in the chain is closest to the hot spot, and the oldest island is farthest from the hot spot.

Hot spots are also found under continental plates. However, it is more difficult for magma to rise up through the much thicker crust of a continent. Therefore, hot spot volcanic eruptions are less common in continental than oceanic crust. An exception is the Yellowstone hot spot. In the past, this very active hot spot produced enormous volcanic eruptions. Now it causes the region's famous hot geysers, including the geyser named "Old Faithful."

Circle the letter of the correct choice.

1. Plate tectonics helps to explain
 - a. how mountains form.
 - b. where new seafloor is created.
 - c. why earthquakes occur where they do.
 - d. all of the above

2. The Pacific Ring of Fire is a ring around the Pacific Ocean where
 - a. volcanoes are common.
 - b. tectonic plates interact.
 - c. many hot spots occur.
 - d. two of the above

3. Plates move over Earth's surface at a rate of
 - a. 100 kilometers per year.
 - b. a few kilometers per year.
 - c. a few centimeters per year.
 - d. a couple of millimeters per year.

4. Plates move over Earth's surface because of
 - a. conduction within the crust.
 - b. subduction in the outer core.
 - c. radiation from the inner core.
 - d. convection within the mantle.

5. Magma from the mantle rises up through Earth's crust at
 - a. deep-sea trenches.
 - b. mid-ocean ridges.
 - c. hot spots.
 - d. all of the above

6. The edge of a plate sinks into the mantle
 - a. where two plates diverge.
 - b. at a subduction zone.
 - c. at a transform boundary.
 - d. none of the above

7. Continental plates do not subduct because they
 - a. are very thick and low in density.
 - b. do not collide with other plates.
 - c. have only intraplate activity.
 - d. two of the above