

Section 17.3

Objectives

- Describe how Earth's tectonic plates result in many geologic features.
- Compare and contrast the three types of plate boundaries and the features associated with each.
- Generalize the processes associated with subduction zones.

Review Vocabulary

mid-ocean ridge: a major feature along the ocean floor consisting of an elevated region with a central valley

New Vocabulary

tectonic plate
divergent boundary
rift valley
convergent boundary
subduction
transform boundary

Plate Boundaries

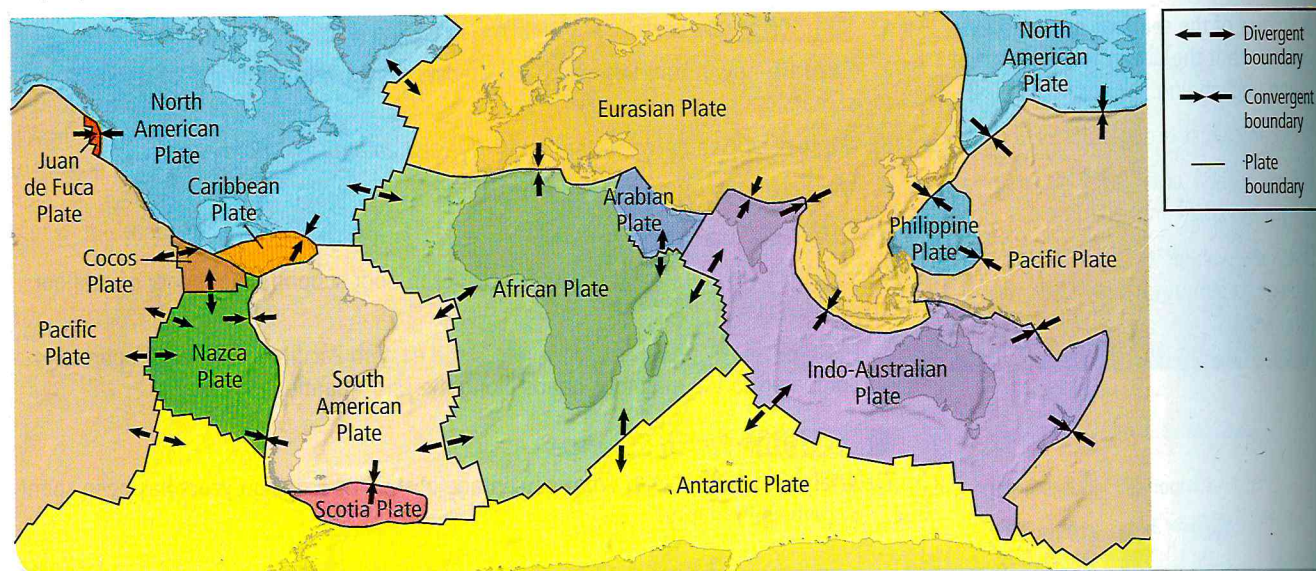
MAIN Idea Volcanoes, mountains, and deep-sea trenches form at the boundaries between the plates.

Real-World Reading Link Imagine a pot of soup that has been allowed to cool in a refrigerator. Fats in the soup have solidified into a hard surface, but if you tilt the pot back and forth, you will see the rigid surface bending and cracking. This is similar to the relationship between different layers of Earth.

Theory of Plate Tectonics

The evidence for seafloor spreading suggested that continental and oceanic crust move as enormous slabs, which geologists describe as tectonic plates. **Tectonic plates** are huge pieces of crust and rigid upper mantle that fit together at their edges to cover Earth's surface. As illustrated in **Figure 17.16**, there are about 12 major plates and several smaller ones. These plates move very slowly—only a few centimeters each year—which is similar to the rate at which fingernails grow. Plate tectonics is the theory that describes how tectonic plates move and shape Earth's surface. They move in different directions and at different rates relative to one another and they interact with one another at their boundaries. Each type of boundary has certain geologic characteristics and processes associated with it. A divergent boundary occurs where tectonic plates move away from each other. A convergent boundary occurs where tectonic plates move toward each other. A transform boundary occurs where tectonic plates move horizontally past each other.

■ **Figure 17.16** Earth's crust and rigid upper mantle are broken into enormous slabs called tectonic plates that interact at their boundaries.



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