

Plate Tectonics ▪ *Section Summary***Earth's Interior****Key Concepts**

- How have geologists learned about Earth's inner structure?
- What are the characteristics of Earth's crust, mantle, and core?

Earth's surface is constantly changing. Earth looks different today from the way it did millions of years ago. People wonder, "What's inside Earth?" The extreme conditions in Earth's interior prevent exploration far below the surface. **Geologists have used two main types of evidence to learn about Earth's interior: direct evidence from rock samples and indirect evidence from seismic waves.**

Rocks from inside Earth give geologists clues about Earth's structure. Geologists can make inferences about conditions deep inside Earth where these rocks formed. Using data from **seismic waves** produced by earthquakes, geologists have learned that Earth's interior is made up of several layers.

The three main layers of Earth are the crust, the mantle, and the core. These layers vary greatly in size, composition, temperature, and pressure. Beneath the surface, the temperature decreases for about 20 meters, then increases until the center of Earth is reached. **Pressure** results from a force pressing on an area. Pressure inside Earth increases as you go deeper.

The **crust** is the layer of rock that forms Earth's outer skin. The **crust is a layer of solid rock that includes both dry land and the ocean floor.** Oceanic crust consists mostly of rocks such as **basalt**, dark rock with a fine texture. Continental crust, the crust that forms the continents, consists mainly of rocks such as granite. **Granite** is a rock that usually is a light color and has a coarse texture.

Below a boundary 40 kilometers beneath the surface is the solid material of the **mantle**, a layer of hot rock. **Earth's mantle is made up of rock that is very hot, but solid. Scientists divide the mantle into layers based on the physical characteristics of those layers.** The uppermost part of the mantle and the crust together form a rigid layer called the **lithosphere**. Below the lithosphere is a soft layer called the asthenosphere. Beneath the **asthenosphere**, the mantle is solid. This solid material, called the lower mantle, extends all the way to Earth's core.

The core is made mostly of the metals iron and nickel. It consists of two parts—a liquid outer core and a solid inner core. The **outer core** is a layer of molten metal that surrounds the inner core. The **inner core** is a dense ball of solid metal.

Scientists think that movements in the liquid outer core create Earth's magnetic field. Because Earth has a magnetic field, the planet acts like a giant bar magnet.

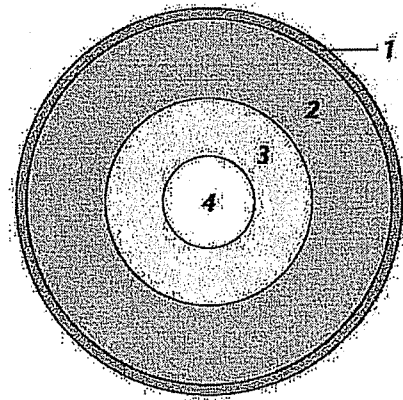
Plate Tectonics ■ *Review and Reinforce*

Earth's Interior

Understanding Main Ideas

Label the layers of Earth by writing the name of the layer in the blank.

1. _____
2. _____
3. _____
4. _____



Earth's layers

Answer the following questions on a separate sheet of paper.

5. What are two types of evidence geologists use to learn about Earth's interior?
6. Compare and contrast the asthenosphere with the lithosphere.

Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term in the left column.

- _____ 7. basalt
- _____ 8. asthenosphere
- _____ 9. crust
- _____ 10. outer core
- _____ 11. lithosphere
- _____ 12. granite
- _____ 13. pressure
- _____ 14. seismic wave

- a. a rock that makes up much of the ocean floor
- b. the force pushing on a surface or area
- c. the layer made up of liquid iron and nickel
- d. the uppermost part of the mantle
- e. a rock that makes up the core of the continents
- f. outer rind of rock
- g. a wave produced by an earthquake
- h. soft layer of rock in the mantle

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