

SECTION 10-1 SECTION SUMMARY

Inside Earth

Guide for Reading

- ◆ What conditions and forces do geologists study?
- ◆ What are the major layers of Earth's interior?

The material that makes up Earth's hard outer surface is **rock**. A layer of solid rock called the **crust** surrounds Earth's surface like the tough shell of a walnut. Scientists have drilled deep holes into the crust to study the rocks below the surface. Drilling helps scientists obtain samples of the rock that makes up the crust, which ranges from about 5 to 40 kilometers in thickness.

Geology is the study of planet Earth, including its surface and interior. Scientists who study Earth and the processes that have shaped Earth over time are called **geologists**. **Geologists study physical conditions, such as temperature and pressure, inside Earth. Geologists also study the forces inside Earth that affect the surface.**

Although drilling has provided geologists with some data on Earth's crust, most of what geologists know about the interior of Earth is based on indirect evidence from seismic waves. **Seismic waves** are vibrations that travel through Earth every time an earthquake shakes the ground. Geologists have recorded the paths taken by seismic waves. From this evidence, they have inferred Earth's composition and structure.

Earth is made up of layers like an onion. **The major layers that make up Earth are the inner core, outer core, mantle, and lithosphere. The lithosphere includes the crust and the uppermost part of the mantle.** These layers differ in composition or physical conditions. For example, temperature and pressure increase with depth beneath Earth's surface.

The core is divided into two layers. The **inner core** is a sphere of hot, solid metal. Surrounding the inner core is the liquid **outer core**. Most scientists accept the hypothesis that both parts of the core are made of iron and nickel. They hypothesize that circulation of molten metal within Earth's core helps to create a magnetic field.

Surrounding the core is a thick layer called the **mantle**. It is made of hot but mostly solid material. The **lithosphere** is Earth's rigid, outer covering. It includes the crust and the uppermost part of the mantle down to a depth of about 100 kilometers.

SECTION 10-1 REVIEW AND REINFORCE

Inside Earth

◆ **Understanding Main Ideas**

Fill in the blanks in the table below.

| Layer of Earth | Description |
|----------------|---|
| 1. _____ | Outer layer of solid rock surrounding the surface |
| Mantle | Hot but mostly 2. _____ material surrounding the core |
| 3. _____ | Hot liquid layer of iron and nickel |
| 4. _____ | Hot, 5. _____ layer of iron and nickel |

Answer the following question on a separate sheet of paper.

6. What conditions and forces do geologists study?

◆ **Building Vocabulary**

Fill in the blank to complete each statement.

7. Evidence from earthquake vibrations, called _____, help geologists infer the structure of Earth's interior.
8. The material that makes up Earth's hard outer surface is _____.
9. The science of _____ is the study of planet Earth.
10. The _____ includes the uppermost part of the mantle and the crust.
11. Scientists who study Earth and the processes that shape it are known as _____.