

## 1.2 Earth's Complex Structure

**Main Idea** Physical processes within Earth bring about changes on the surface.

If you could dig a tunnel to Earth's center, you would travel through several layers. Each layer would be under tremendous pressure and give off intense heat.

### Earth's Layers

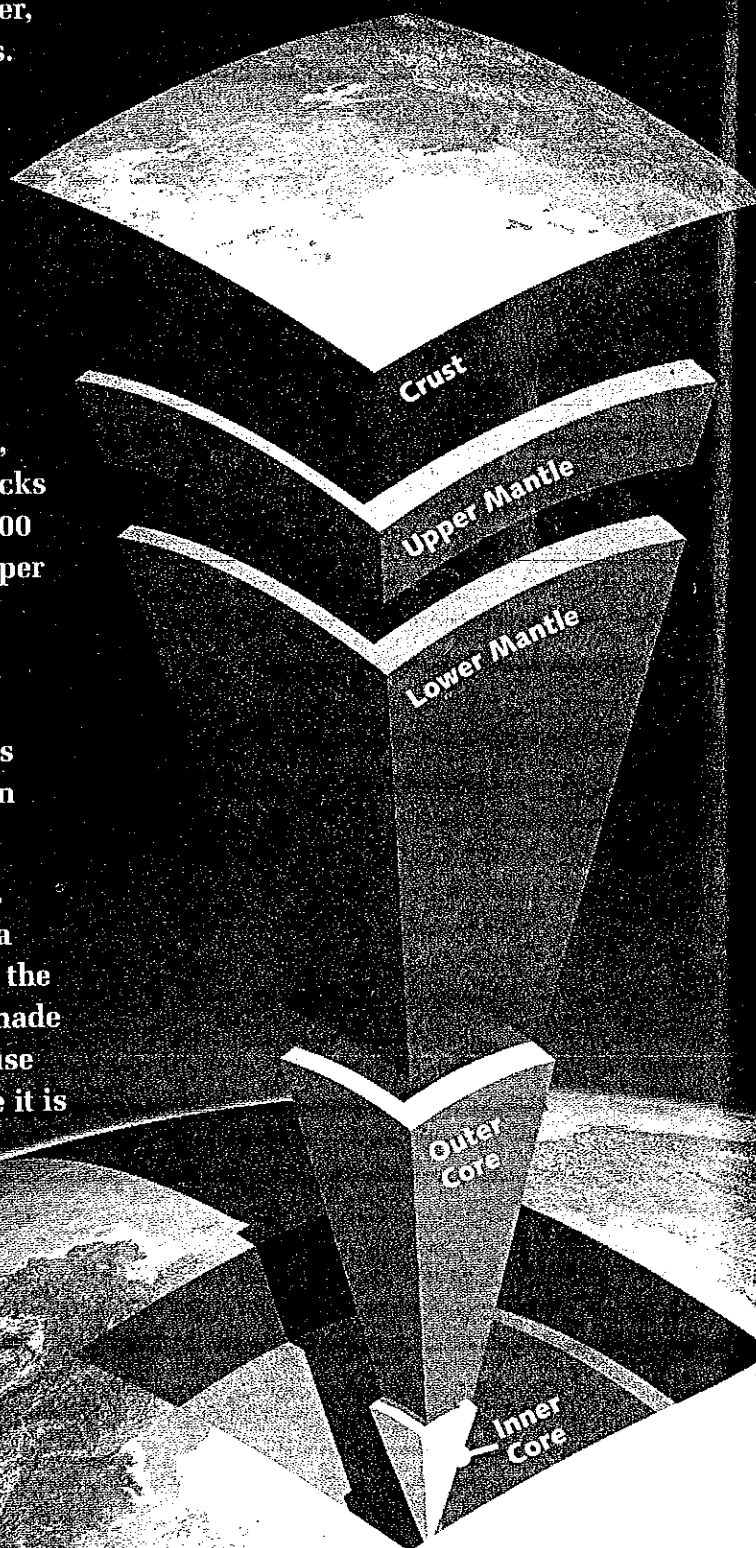
On your journey, you would first pass through the crust. This layer includes landmasses and the ocean floor. It is about 30 miles thick.

Next, you would come to the mantle, which consists of molten, or melted, rocks called magma. The mantle is about 1,800 miles thick and has two parts—the upper mantle and the lower mantle.

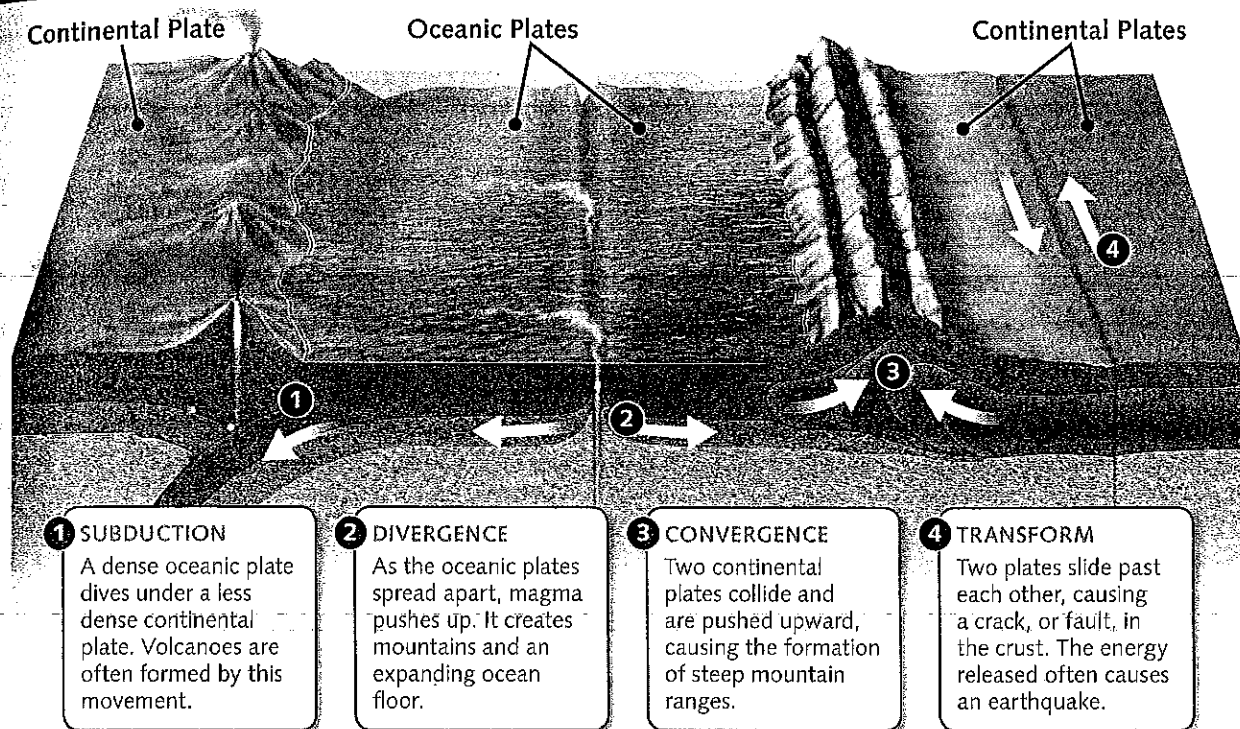
Descending even deeper, you would find yourself in the outer core, which is about 1,400 miles thick. This layer is mostly liquid, consisting of molten iron and nickel.

At the very center is the inner core. It is about 700 miles thick. It reaches a temperature of 12,000° F—hotter than the surface of the sun. The inner core is made up of iron, which remains solid because the pressure from all the layers above it is so intense.

### EARTH'S STRUCTURE



## TECTONIC PLATE MOVEMENTS



### 1 SUBDUCTION

A dense oceanic plate dives under a less dense continental plate. Volcanoes are often formed by this movement.

### 2 DIVERGENCE

As the oceanic plates spread apart, magma pushes up. It creates mountains and an expanding ocean floor.

### 3 CONVERGENCE

Two continental plates collide and are pushed upward, causing the formation of steep mountain ranges.

### 4 TRANSFORM

Two plates slide past each other, causing a crack, or fault, in the crust. The energy released often causes an earthquake.

## Tectonic Plates

Earth's crust is divided into sections called **tectonic plates**. The plates float on Earth's mantle. They are constantly shifting and may move up to four inches a year.

The seven continents rest on these tectonic plates. As the plates have shifted over time, the continents have moved into their current positions. This slow movement of the continents is known as **continental drift**.

Tectonic plates move in four ways, as shown in the diagram above. The enormous force of the movements and collisions creates mountains and causes earthquakes and volcanoes.

### Before You Move On

**Make Inferences** How do the movements of tectonic plates change Earth's surface?

### ONGOING ASSESSMENT

## VIEWING LAB

- Analyze Visuals** According to the diagram above, which tectonic plate movement often results in volcanoes? Which movement can cause earthquakes?
- Place** The Himalaya Mountains formed by convergence when the Indian plate collided with the Eurasian plate. The Indian plate is still moving almost an inch north every year. How do you predict this will affect the Himalayas?
- Summarize** What is the main characteristic of each layer of Earth?