

Key Concept Summaries

Convection and the Mantle

How Is Heat Transferred?

Heat is constantly being transferred inside Earth and all around Earth's surface. The movement of energy from a warmer object to a cooler object is called heat transfer. **There are three types of heat transfer: radiation, convection, and conduction.**

The transfer of energy that is carried in rays like light is called **radiation**. Heat transfer by the movement of a fluid is called **convection**. Heat transfer between materials that are touching is called **conduction**.

How Does Convection Occur in Earth's Mantle?

Density is a measure of how much mass there is in a given volume of a substance. The flow that transfers heat within a fluid is called a **convection current**. **Heating and cooling of a fluid, changes in the fluid's density, and the force of gravity combine to set convection currents in motion.** Inside Earth, large amounts of heat are transferred by convection currents within the core and mantle. **Heat from the core and the mantle itself causes convection currents in the mantle.**

Over millions of years, the great heat and pressure in the mantle have caused solid mantle rock to warm and flow very slowly. Many geologists think that plumes of mantle rock rise slowly from the bottom of the mantle toward the top. The hot rock eventually cools and sinks back through the mantle. Over and over, the cycle of rising and sinking takes place. Convection currents like these have been moving inside Earth for more than four billion years!

On a separate sheet of paper, describe how the way heat is transferred inside Earth differs from the way heat is transferred from the sun to Earth.

