

## How Can We Describe Thermal Energy?

Have you ever used a thermometer to measure temperature? You have learned that thermal energy is a form of energy that describes the motion of atoms and molecules. Temperature tells us how fast the particles in matter are moving. High temperatures mean the molecules are moving fast and have a lot of energy. Lower temperatures mean the molecules are moving more slowly and have less energy. The movement of molecules is what makes things feel hot or cold.

Heat is the transfer of thermal energy from one object to another.

Heat flows when an object is warmer than its surroundings. Heat always flows from hotter materials to cooler materials, never the other way. Heat flows until objects and their surroundings have the same temperature.

When you hold your hands around a mug of hot chocolate, your body gets warmed. This happens because heat flows from the hot mug into your skin. Thermal energy is transferred from the cup to your hands. Your body gains energy, and your temperature rises as a result. Energy is lost from the mug, however. Its temperature decreases.

▶ **How are temperature and heat related?**

The Sun is the most important source of heat for life on our planet.



These heating coils in an oven are warmed by an electric current. The space inside the oven is warmed by heat flowing from the hot coils.

