

## Lesson 5. Thermal Energy

The total amount of energy in our universe today has remained consistent. The reason for this is that energy cannot be created nor destroyed. Energy can also change form and transfer between objects. A common example of energy transfer is thermal energy, which is related to temperature. When the temperature of a substance rises, the molecules in it move faster and gain thermal energy through heat transfer. There are three ways in which thermal energy transfers, conduction, convection, and radiation. **Conduction** describes when thermal energy is transferred between molecules that are in contact with each other. An example of this is heating a pan on the stove. **Convection** only occurs with liquids and gases. An example of this is a hot air balloon. The heated air in the balloon is less dense which causes the colder air to fall beneath it, this pushes the warm air upwards along with the balloon. **Radiation** is probably the most important, as it helps to sustain life on Earth. Radiation transfers heat through the vacuum of space. An example of this is the thermal energy the Earth receives from the Sun. The Sun transfers energy to the surface of the Earth in the form of electromagnetic waves. The visible light we see from Earth are considered waves of energy.

### Respond to Reading

#### Directions

Respond to the questions below. Underline and identify specific lines from the passage that support your claim.

Which method of thermal energy transfer (**conduction, convection, & radiation**) is used in the process of photosynthesis?

Is photosynthesis possible without thermal energy transfer? Explain your answer.