

Building Blocks of Science: Heat

1. How do humans use heat?
2. What is the Earth's most important source of heat?
3. What is thermal energy?
4. What happens to the particles in matter when it is heated?
5. True or False? Heat flows from cooler objects to warmer objects.
6. Explain why ice melts in water?
7. What is temperature?
8. How do thermometers work?
9. What is conduction?
10. Explain how heat transfers between objects.
11. What is convection?
12. What is radiation?
13. What are conductors? Give examples.
14. What are insulators? Give examples.

ANSWERS: Building Blocks of Science – Heat (Secondary)

- 1.** To maintain a steady body temperature.
To cook food.
To warm homes.
To bend and shape metals to produce goods.
To power engines such as cars and aeroplanes.
- 2.** The sun.
- 3.** Thermal energy is the energy that makes the particles in matter move.
- 4.** When we heat matter, the thermal energy in its particles increases and the more energy the particles have, the faster they move.
- 5.** False. Heat always flows from warmer objects to cooler objects.
- 6.** Thermal energy from the warmer liquid water flows to the cooler ice. The particles in the ice speedup, causing the ice to melt and change from a solid to a liquid.
- 7.** Temperature is a measure of the thermal energy in an object.
- 8.** When you measure something hot, the liquid in the thermometer expands thus moves up the tube in the thermometer. When you measure something cold, the liquid contracts, thus moving further down the tube.
- 9.** Conduction is the movement of heat from one particle to another.
- 10.** Thermal energy causes the particles in solids to vibrate as they are heated. The particles then bump into nearby particles. For example, if a metal spoon is left in a hot pot of food, the entire spoon heats up because the heat of the food then heats up the tip of the spoon. The particles in the tip of the spoon then bump into other particles in the spoon, transferring thermal energy throughout the spoon.
- 11.** Convection is the movement of heat from one place to another e.g. in boiling water heat moves from the warmer water to the cooler water at the top.
- 12.** Radiation is the movement of heat without any matter to carry it i.e. it moves through open space.
- 13.** Conductors are materials that help heat to move easily between objects. For example, metals are good conductors, such as frying pans.
- 14.** Insulators are materials that reduce the motion of heat. For example, oven mitts and jackets made of down feathers.