



BUILDING BLOCKS OF PHYSICAL SCIENCE

Heat

What is heat, and how do we use it? Follow the cartoon character "Heat" to discover the answers in ice water, on asphalt roads, and even in the center of Earth!

What did you learn?

QUESTIONS

1. People use heat to do what?
 - a. Cook food
 - b. Warm homes
 - c. Bend and shape metals
 - d. All of the above
2. Electric power runs which of these items?
 - a. Lights
 - b. Toasters
 - c. Computers
 - d. All of the above
3. Most solids and liquids _____ when they are heated.
 - a. Expand
 - b. Contract
 - c. Stay the same
 - d. Dissolve
4. Burning is a sign of a ...
 - a. Physical change
 - b. Chemical change
 - c. Heat change
 - d. None of the above
5. Can you describe how heat moves in a glass of ice water?
6. Can you explain why a metal spoon left in a pot of food becomes hot?

TRUE OR FALSE?

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| _____ 1. Your body creates heat when it uses food. | _____ 4. Temperature is a measure of the thermal energy in an object. |
| _____ 2. The sun is Earth's most important source of heat. | _____ 5. The movement of heat without any matter to carry it is called convection. |
| _____ 3. Cold objects have more thermal energy than hot objects. | _____ 6. Conductors are materials that reduce the motion of heat. |

ANSWERS

- 1. d. All of the above.** According to page 7, we know that, "People use heat to cook food and warm their homes. In factories, heat is used to bend and shape metals." So, the correct answer is D.
- 2. d. All of the above.** According to page 9, we know that, "Electric power runs everything from lights to toasters to computers." So, the correct answer is D.
- 3. a. Expand.** According to page 16, we know that, "Most solids and liquids expand when they are heated." So, the correct answer is A.
- 4. b. Chemical change.** According to page 21, we know that, "Burning is a sign of chemical change." So, the correct answer is B.
- 5.** According to page 14, we know that, "The particles in the ice are moving slowly. The liquid water is warmer than the ice, so its particles are moving a little faster. The thermal energy from the liquid water flows to the ice. Then the particles in the ice speed up. This causes the ice to melt. It changes from a solid to a liquid. Eventually, all the water in the glass becomes the same temperature. Now, all of the water particles in the glass are moving at the same speed."
- 6.** According to page 23, we know that, "The hot food heats up the tip of the spoon ... Then hot particles in the tip of the spoon shake faster and bump into the particles next to them. This transfers thermal energy. These particles then bump into other particles. This is how heat moves up the spoon's handle."

TRUE OR FALSE? ANSWERS

- 1. True.** According to page 6, we know that, "Your body creates heat when it uses food." So, the correct answer is True.
- 2. True.** According to page 10, we know that, "The sun is Earth's most important source of heat." So, the correct answer is True.
- 3. False.** According to page 13, we know that, "Hot objects have more thermal energy than cold objects." So, the correct answer is False.
- 4. True.** According to page 18, we know that, "Temperature is a measure of the thermal energy in an object." So, the correct answer is True.
- 5. False.** According to page 25, we know that, "The movement of heat without any matter to carry it is called radiation." So, the correct answer is False.
- 6. False.** According to page 26, we know that, "Insulators are materials that reduce the motion of heat." So, the correct answer is False.