

Assessment

Heat**Section Quiz: Defining Heat**

Write the letter of the correct answer in the space provided.

- _____ 1. What term is defined as the energy transferred between objects with different temperatures?
- internal energy
 - work
 - heat
 - thermal equilibrium
- _____ 2. What must be true if energy is to be transferred as heat between two bodies in physical contact?
- The two bodies must have different volumes.
 - The two bodies must be at different temperatures.
 - The two bodies must have different masses.
 - The two bodies must be in thermal equilibrium.
- _____ 3. What occurs to the particles in a substance at low temperature when energy is transferred to the substance as heat?
- The average kinetic energy of the particles increases.
 - The average kinetic energy of the particles remains constant.
 - The average kinetic energy of the particles decreases.
 - The average kinetic energy of the particles varies unpredictably.
- _____ 4. If energy is transferred spontaneously as heat from a substance with a temperature of T_1 to a substance with a temperature of T_2 , which of the following statements must be true?
- $T_1 < T_2$
 - $T_1 = T_2$
 - $T_1 > T_2$
 - More information is needed.
- _____ 5. A container with a temperature of 37°C is submerged in a bucket of water with a temperature of 15°C . An identical container with a temperature of T_1 is submerged in an identical bucket of water with a temperature of T_2 . If the amounts of energy transferred as heat between the containers and the water are the same in both cases, which of the following statements is true?
- $T_1 = 5^\circ\text{C}; T_2 = 37^\circ\text{C}$
 - $T_1 = 10^\circ\text{C}; T_2 = 47^\circ\text{C}$
 - $T_1 = 12^\circ\text{C}; T_2 = 32^\circ\text{C}$
 - $T_1 = 7^\circ\text{C}; T_2 = 29^\circ\text{C}$

Heat *continued*

- _____ 6. What is the process by which energy is transferred by the motion of cold and hot matter?
- a. thermal conduction
 - b. thermal insulation
 - c. convection
 - d. radiation
- _____ 7. Which of the following is *not* a good thermal insulator?
- a. ceramic
 - b. iron
 - c. fiberglass
 - d. cork
- _____ 8. An arrow strikes a target, causing an internal energy increase of 18 J. If the arrow is fired so that it enters the target at the same height above the ground as when it was fired, what is the arrow's initial kinetic energy?
- a. 0 J
 - b. 9 J
 - c. 18 J
 - d. 27 J

9. Describe how energy is transferred between two objects at different temperatures, and how they reach thermal equilibrium.

10. A stone with a mass of 0.450 kg is dropped from the edge of a cliff. When the stone strikes the ground, the internal energy of the stone and ground increase by 1770 J. If the stone is initially at rest when it is dropped, how high above the ground is the cliff? ($g = 9.81 \text{ m/s}^2$)