Sept 17 Thermal Energy Quiz

Directions: Read the passage below, then answer the multiple-choice questions below.

1 Long ago, scientists believed that heat was an invisible fluid. In the late 1700s, Benjamin Thompson, an American inventor as well as a physicist, showed that heat is a form of energy. Energy is a natural force that can do work or cause change. Energy cannot be made or destroyed. It can, however, be transferred from one object to another. This is known as the conservation of energy. Thermal energy is one of these types of energy. Thermal energy is the energy of heat that transfers from hotter objects to colder objects. It will continue to move from one object to another until all objects have reached the same temperature. energy can move in three different ways: by conduction, convection, and radiation.

2 Conduction is the transfer of heat that occurs when two objects of different temperatures touch. Conduction occurs in solids such as metals. For example, the handle of a metal spoon left in a hot bowl of soup warms up as the molecules at the heated end move faster and collide with other molecules, getting them moving. The heat travels through the metal spoon, which is a good conductor of heat. Pretty soon, the handle of the spoon is just as hot as the end of the spoon in the soup.

3 In liquids and gases, convection is usually the most efficient way to transfer heat. Convection occurs when substances of different temperatures mix. When a liquid or a gas is heated, it expands. It rises because it has become less dense. The cooler, denser liquid or gas sinks. Convection is responsible for making macaroni rise and fall in a pot of heated water. The warmer portions of the water are less dense and therefore they rise. Meanwhile, the cooler portions of the water fall because they are denser. Movements like this in liquids or gases are called convection currents.

4 Both conduction and convection require a medium to transfer heat. Radiation is the transfer of heat through electromagnetic waves that move through empty space. Sunlight is a form of radiation that is radiated through space to our planet without the aid of fluids or solids. We feel the heat from the Sun even though we are not touching it. Imagine it! The Sun transfers heat through 93 million miles of space. There are no solids (like a huge spoon) touching the Sun and our planet. There are no fluids (like a pot of water) in space. Radiation brings heat to Earth. Let's think of it on a smaller scale. When you stand near a campfire, you can feel the heat, but you are not touching the fire. The heat is transferring by radiation.

1. Which of the following is a FALSE statement?
A. Heat moves through solids by conduction.
B. Molecules move faster in warmer substances.
C. Warm water is denser than cold water.
D. Heat moves through liquids and gases by convection.

2. What is an example of conduction?
A. Touching a stove and burning your hand
B. An old-fashioned radiator
C. Heat from a fire
D. Batteries

3. What is another example of convection?
A. A heater in a fish tank warming the water at the bottom of the tank
B. Batteries in a flashlight converting chemical energy into light
C. Touching a stove and burning your hand
D. Warming up next to a fire on a cold night

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4. What is another example of radiation?

A. Warm air rising

B. Heat from an old-fashioned radiator

C. Batteries

D. Touching a stove and burning your hand

5. The word medium is used in Paragraph 4. Which of the following could be the definition of medium?

A. A vacuum

B. Empty space

C. Anything with molecules; matter

D. The absence of molecules in an area

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