S U M M A R I E S

INVESTIGATION 1: Temperature and Heat

In Investigation One, you explored heat, temperature, and kinetic energy. During this Investigation, you:

1. created a model of a thermometer by placing a balloon on top of a test tube of hot alcohol.
2. used a thermometer to measure the temperature of cold, warm, and hot water.
3. observed the spread of food coloring in cold, warm, and hot water.

Through these experiments, you concluded that:

1. alcohol expands when it becomes warm and contracts when it becomes cold.
2. the colder the water, the lower the temperature. The warmer the water, the higher the temperature.
3. food coloring spreads quickly in hot water and slowly in cold water.
4. as temperature increases, kinetic energy increases. As temperature decreases, kinetic energy decreases.

INVESTIGATION 2: Transferring Heat

In Investigation Two, you explored heat transfer. During this Investigation, you:

1. created a thermos to keep water cold.
2. tested to find whether or not the thermos was able to keep water cold.
3. tested to find whether metal cubes and acrylic cylinders and other items were conductors or insulators of heat.
4. calculated the rate of heat transfer (change in temperature over a period of time) for the thermos.

Through these experiments, you concluded that:

1. the materials used to make a thermos affect whether or not the thermos insulates well.
2. metal cubes and other materials made of metal are better conductors than insulators of heat.
3. acrylic cylinders and materials made of plastic and wood are better insulators than conductors of heat.
4. an insulated beaker slows the rate of heat transfer.

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INVESTIGATION 3: Converting Energy

In Investigation Three, you explored endothermic and exothermic reactions. During this Investigation, you:

1. measured the temperature of steel wool.
2. measured the temperature of steel wool covered with vinegar.
3. measured the temperature of vinegar.
4. measured the temperature of vinegar after baking soda had been added.

Through these experiments, you concluded that:

1. endothermic reactions absorb heat.
2. exothermic reactions release heat.
3. the temperature of steel wool increased after adding vinegar, suggesting that an exothermic reaction occurred.
4. the temperature of the vinegar decreased after adding baking soda, suggesting that an endothermic reaction occurred.

INVESTIGATION 4: Heat and the Body

In Investigation Four, you explored heat and the body. During this Investigation, you:

1. measured the temperature of three wet paper towels: one covered, one open to the air, and one swinging in the air.
2. felt the effects of covering a hand with a plastic bag instead of letting the air surround it.
3. changed the temperature of the air from your lungs by changing the size of the opening you blew air through.

Through these experiments, you concluded that:

1. evaporation causes a decrease in temperature.
2. the body tries to maintain a constant normal temperature.
3. the body perspires when it is warm so that evaporation causes it to cool.
4. air is cooled as it is compressed and allowed to expand.

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INVESTIGATION 5: Matter and Heat

In Investigation Five, you explored factors that affect heat transfer. During this Investigation, you:

1. measured the temperature of three samples of water of different masses. You measured temperature again after 15 minutes.
2. measured the temperature of two equal masses of water in beakers of different surface area. You measured temperature again after 15 minutes.
3. calculated the rate of heat transfer (change in temperature over a period of time) in each trial.

Through these experiments, you concluded that:

1. increasing the mass of water decreases the rate of heat transfer.
2. increasing the surface area of the water in contact with the air increases the rate of heat transfer.