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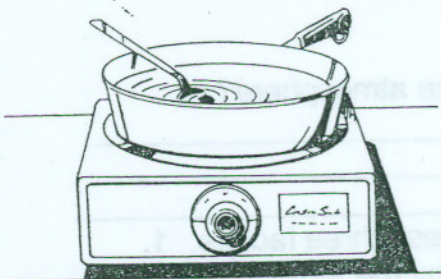
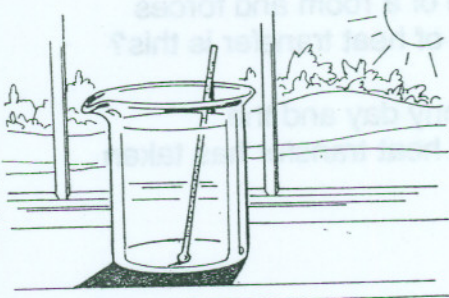
Experiment: Three Types of Energy Transfer
(E. Science 9-15-2b)

Purpose: To draw conclusions from different experiments dealing with heat transfer.

Materials: 500 mL beaker hot plate
thermometer metal spoon
100 mL beaker water

Methods:

1. Fill the 500 beaker with 200 mL of water.
2. Record the temperature of the water in the beaker.
3. Place the beaker of water near the window in the direct sunlight.
4. After one class period, record the temperature of the water.
5. Half fill the 100 mL beaker with water and place it on the hot plate.
6. Place the spoon in the water as in the diagram (we are using a 100 mL beaker instead of a pan).
7. After heating for a number of minutes, gently touch the spoon. CAUTION: The spoon may be hot. Record your observations.
8. Place one thermometer on the floor, another on the desk, and the third one at the highest point in the room. After one minute record the temperatures of each in degrees Celsius.



9. Most weather maps are recorded in Universal Coordinated Time (**UTC**) or "Z" time, so coordinated weather readings can be made. Z time is the time along the Prime meridian, 0 (zero) degrees longitude, which goes through England. (We are 5 time zones to the west, thus are 5 hours earlier. When we switch to savings time in the spring we will only be four hours earlier).

10. When we load up today's weather map for our long term lab record the local date and time of the map in the results section of this lab.

Results:

2. beginning temp: _____ 4. ending temp: _____
7. observations of spoon: _____
8. temperatures at the floor temperature: _____
desk: _____ high: _____
10. local date and time of map: _____

Conclusions:

1. Describe what happened to the temperature of the water in the beaker after exposing it to sunlight.

2. Identify the type(s) of heat transfer that occurred in the 500 mL beaker.
3. Identify the type of heat transfer that occurred in the 100 mL beaker.
4. Identify the type(s) of heat transfer that is occurring in the room.
 - a. _____
 - b. _____
 - c. _____
5. Describe where the temperature in the room was the highest. Explain why.
6. Explain what happened to the temperature of the spoon when the water in the 100 mL beaker was heated.

Discussion:

1. After analyzing all of your observations and conclusions, name and then explain the three ways heat is transferred.
 - a. _____
 - b. _____
 - c. _____
2. Beside each of the following methods of heat transfer, write the type described (conduction, convection, or radiation).
 - a. _____ Sitting around a campfire and warming up.
 - b. _____ A pan heating on the stove
 - c. _____ A furnace heating a home.
 - d. _____ Hot sand in the desert heating surrounding air.
 - e. _____ Earth's surface transferring heat back to the atmosphere.
4. In some home heating systems, warm air rises on one side of a room and forces cold air across the room where it sinks to the floor. What type of heat transfer is this?
5. When you get in a closed car (that is not running) on a sunny day and the temperature inside is much warmer than outside, what type of heat transfer has taken place?
6. What are the factors that affect air pressure.
7. The two most abundant gases in the atmosphere are:
8. What is the importance of each of the following gases to the atmosphere?
 - a. carbon dioxide: _____
 - b. water vapor: _____
 - c. ozone: _____
9. To maintain life on Earth there needs to be a balance of these three factors. 1. some energy escapes back into space. 2. some is absorbed by the atmosphere, and 3. some is absorbed by the land and water surfaces. Scientists say that this is going out of balance and the Earth is warming too much, cold weather may not occur much any more, and there would be flooding due to polar ice caps melting. Read Gen. 8:22 and record the promise that God has given us concerning these issues.