

Heat—Lesson Three

Investigating Heat Convection

Standard VI: Heat, light, and sound are all forms of energy. Heat can be transferred by radiation, conduction, and convection. Visible light can be produced, reflected, refracted, and separated into light of various colors. Sound is created by vibration and cannot travel through a vacuum. Pitch is determined by the vibration rate of the sound source.

Objective 1: Investigate the movement of heat between objects by conduction, convection, and radiation.

Indicator b: Describe the movement of heat from warmer objects to cooler objects by conduction and convection.

Indicator d: Observe and describe, with the use of models, heat energy being transferred through a fluid medium (liquid and/or gas) by convection currents.

Indicator e: Design and conduct an investigation on the movement of heat energy.

A. Literary Reading

Materials:

1. Literacy Reading—Heat Transfer (From State Science Teacher Resource Book, 2006 page 6-16)
2. Heat Transfer Examples (From State Science Teacher Resource Book, 2006 page 6-18)
3. Two baby food jars
4. Hot water in one and cold water in the other
5. Blue food coloring
6. Red Food Coloring

Directions:

1. Review the important parts about heat transfer and conduction.
2. Read just about **Convection** on page 6-16b.

- a. Discuss what convection means from the reading.
- b. You may want to demonstrate the baby jar experiment by putting blue cold water in a baby jar on top and red hot water in a baby jar on the bottom and see the liquids change places.

3. Show the examples of convection from page 6-18.

B. Bang-The Convection Process

Materials:

1. Bing! Bang! Boom! Activity (From the Elementary CORE Academy 2004, pages 7-4, 7-6, and 7-7).
2. Clear plastic cups
3. Thermometers
4. Ice cold water
5. Blue food coloring
6. Room temperature water
7. Hot water
8. Red food coloring
9. Paper towels
10. Small syringe
11. Worksheet "Investigating Convection Currents"

Directions:

1. Review about Convection on pages 7-4.
2. Do Activity #2—'Bang'—The Effect the Convection Process has on Patriotic Water, page 7-6 and 7-7.
3. Fill out the question sheet, "Investigating Convection Currents"

C. Three Temperatures Meet, When Hot and Cold Meet Warm—Convection

Materials:

1. Heat—When Three Temperature Meet Activity (From the Elementary CORE Academy 2006, pages 6-3, 6-4, 6-6, and 6-7.)
2. Baby food jars
3. Transparent container about the size of a small fish aquarium
4. Ice water dyed blue
5. Boiling water dyed red
6. Aluminum foil
7. Rubber bands
8. Activity sheet "When Hot and Cold Meet Warm, page 6-14"

Directions:

1. Review about Heat Energy and Conduction on pages 6-3 and 6-4.
2. Do the Activity #2—Three Temperatures Meet, When Hot and Cold Meet Warm--Convection on pages 6-6 and 6-7.
3. Fill out the activity sheet, When Hot and Cold Meet Warm, page 6-14.