Convection Currents and the Crosscutting Concepts

Please follow all of the directions to complete the investigation.

Safety Note

Be careful around hot water. Use protective gear as indicated by your instructor.

1. Take out your laboratory notebook and title your page "Convection Currents." Be sure to add the date to your page.

2. In this lab, you investigate how water of different temperatures moves. You will need the following materials:

   - 1 plastic shoebox filled halfway with room temperature (21°C) water
   - 1 half pint sized jar containing ice
   - 1 half pint sized jar containing hot water (follow your instructors directions for obtaining the hot water)
   - 1 dropper bottle of food coloring

3. Place the jar of hot water and the jar of ice into the plastic shoe box that is half filled with room temperature water. See "Image 1" on page two.

4. Place 5 drops of food coloring near the jar filled with ice.

5. Watch the food coloring and record your observations in your laboratory notebook. (5-10 minutes)

6. Draw a picture in your laboratory notebook that captures your observations. Be sure to label your drawing.

7. Discuss your observations with your group and share your laboratory notebook.

8. Dump the jars of hot water and ice into the shoe box of water.

9. Dump the content of the shoebox down the sink.

10. Dry and return your materials. Then complete the "Thinking with Evidence" questions on page two. Respond to the questions in your laboratory notebook.

Thinking with Evidence

1. What patterns did you observe as the water moved?
2. What caused the water to move the way it did? What was the effect of the water movement?
3. How would the movement be different if this were on a larger scale like the ocean?
4. Describe how this set-up is a system. (Boundaries, flows, inputs, outputs, etc.)
5. Describe the flow of energy and matter in the set-up.
6. How does the shape of the plastic shoebox influence the movement of the water?
7. What would happen if the water in the jars became the same temperature as the water in the plastic shoebox?

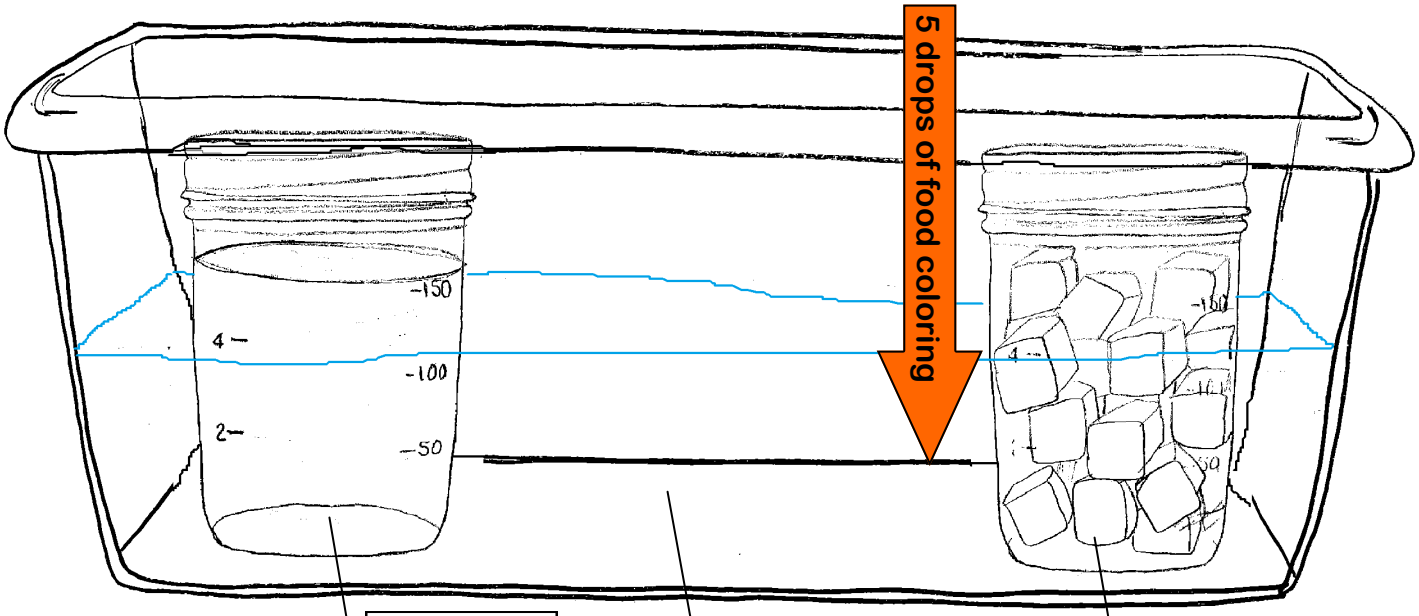

Image 1

Half pint jar filled with hot water

Plastic shoe box half filled with room temperature water

Half pint jar filled with ice