Hot and Cold Cycles

Geology/Earth Science Mr. Traeger

Name: _____ Period: ____ Date: _____

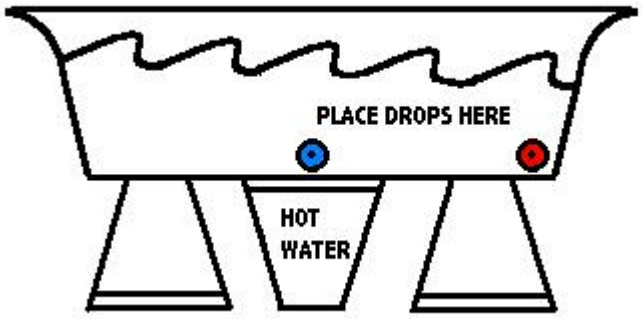
Purpose

The purpose of this activity is to discover a common phenomenon in Earth Science and Thermodynamics. This lesson can be applied to geology, oceanography, and weather.

Materials

- water, hot and cold
- clear plastic rectangular tray
- 3 styrofoam cups
- eyedropper bottle with red food color
- eyedropper bottle with green food color

Adapted from: http://www.fortbragg.k12.ca.us



Procedure

1.Fill tray with cool water. Place tray on top of 2 evenly spaced, inverted Styrofoam cups. (This should support your display well)

2.Fill the 3rd cup with **hot** water from the tap and slide under the center of the tray.

3.Using the eyedropper, gently place a blob of red food color inside the tray, on the bottom center directly over the heat source. Empty the dropper before removing it so that you do not suck water back into the dropper.

4.Place a blob of green food color inside the tray on the bottom near the edge.

5.Observe for 5 minutes and note what happens. Answer the questions that follow.

Questions

1. Draw the path (using arrows) of the warm water and the cool water in the diagram above.

2. Which way does the warmed water move?

3. What happens when the warmed water reaches the surface?

4. Which way does the cooler water on the edges of the tray move?

5. What causes the warmed water to rise?

6. What causes the cooled water to descend?

7. Why does the cooler water move toward the area of heating?

8. How does this mantle convection model explain the movement of Earthôs plates? Explain in detail and draw a diagram of the mantle convection model. Include the landforms that occur at divergent boundaries and convergent subduction boundaries in your drawing.

9. What is ridge push? Explain in detail.

10. What is slab pull? Explain in detail.

11. Which of the 3 hypotheses (mantle convection, ridge push, or slab pull) do you think best explains the movement of the Earthôs plates? Why?