

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

# Convection Lab

## Plate Tectonics

**Objective:** To understand the driving force that moves the Earth's tectonic plates.

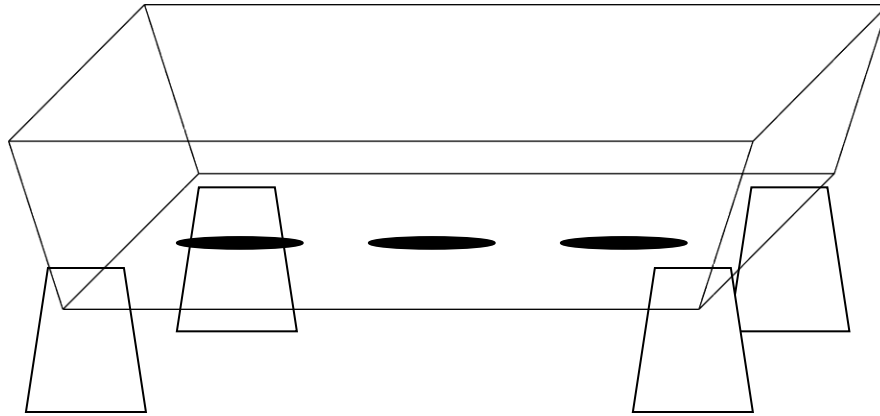
**Directions:**

- 1) Thoroughly **read** through the entire procedure.
- 2) Follow the procedure **CAREFULLY** according to the instructions you just read.
- 3) Sketch your observations.
- 4) Answer the analysis questions using **COMPLETE SENTENCES**.

**Materials:** Plastic box, 5 Styrofoam cups, 8 lids, food coloring, and pipette.

**Procedure:**

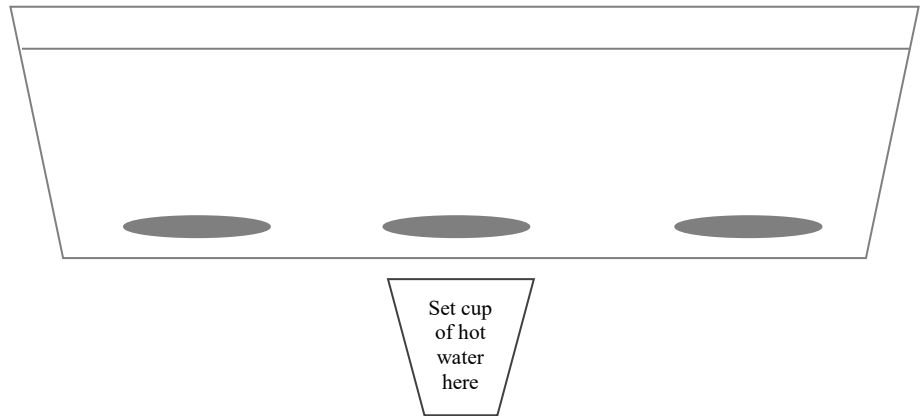
1. Take 4 of the 5 cups and fit 2 plastic lids on each one. Set the 5<sup>th</sup> cup aside.
2. Flip the 4 cups upside down, and set the clear plastic box onto the four cups as shown below. Check that the height is correct by making sure the 5<sup>th</sup> cup can slide smoothly beneath the box.



3. Fill the box about  $\frac{3}{4}$  of the way with **COLD** tap water from the sink. With both hands, place the box back on top of the cups. Let the water become calm before proceeding.
4. Using the pipette, **carefully** place 3 spots of food coloring onto the bottom of the box as shown in the diagram above. Insert the pipette all the way down to the bottom of the box **before** squeezing out the dye. Try to minimize disturbing the water as you insert and remove the pipette. Each spot should be about the size of a quarter. The spots should not touch each other and should be equidistant from each other
5. Fill the empty styrofoam cup with **HOT** tap water. Carefully position it beneath the center dye spot on the box. The plastic lid spacers you placed on the corner cups should provide you with enough clearance to gently slide the cup with hot water under the spot.
6. Now position yourself so that you can view the box from the side at eye level. Observe what happens to the 3 spots over the next 5 minutes. **Be sure to look for changes in all 3 spots.**

7. Record your observations below. Then, sketch what you observed in the diagram below. Use arrows to show the direction of flow. Use a **red colored pencil** to show the flow of warm water and a **blue colored pencil** to show the flow of cooler water.

Observations:



**Analysis Questions:** Read page 110 in the red geology textbook; Then answer in complete sentences.

- In regards to plate tectonic motion, what does the water represent? (*HINT* → Which Earth layer can flow?)  
Earth layer: \_\_\_\_\_
- Look at *Figure 1* on page 110 of the red geology book. What is the name of the circulating motion you observed? Explain how and why it occurs.
- How does a lava lamp help to demonstrate this motion?
- What sea floor feature and what process occur as a direct result of this type of motion?  
(*HINT* → Look at p. 110; What forms directly above the rising magma on the ocean floor?)  
Sea floor feature: \_\_\_\_\_ Process: \_\_\_\_\_
- Now draw this feature (from question #4) where it would belong **on your diagram at the top of this page**.
- Explain what this divergent plate motion has to do with changing temperature and density of magma.  
(see page 110 in the red book)