Lab: Convection Currents

Part 1: Lab Activity – Creating a Convection Current

In this lab, you investigate how water of different temperatures moves.

Materials

- Half pint jar filled with ice
- Half pint jar filled with hot water
- Plastic shoe box half filled with room temperature water
- Image 1
- 5 drops of food coloring

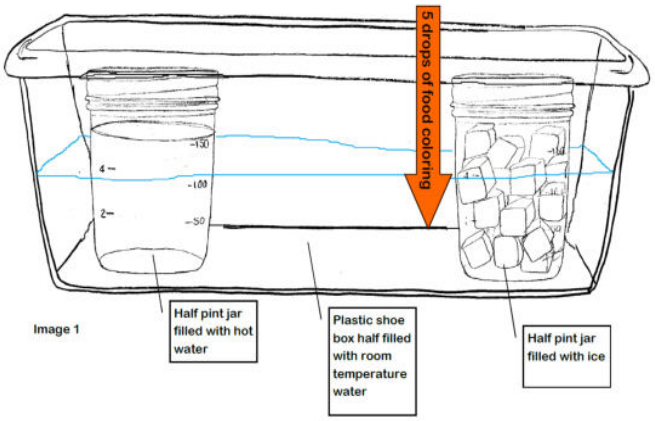


Image 1

Procedure:

A. 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"
B. Place 5 drops of food coloring near the jar filled with ice.
C. Watch the food coloring and record your observations below (5-10 minutes)
D. Draw a picture in the diagram section that captures your observations. Be sure to label your drawing!
E. Discuss your observations and compare diagrams with your lab group.
F. Dump the jars of hot water and ice into the shoe box of water.
G. Dump the contents of the shoebox down the sink.
H. Dry and return your materials.
I. Answer the analysis questions.

Observations:

Diagram

Questions

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.)

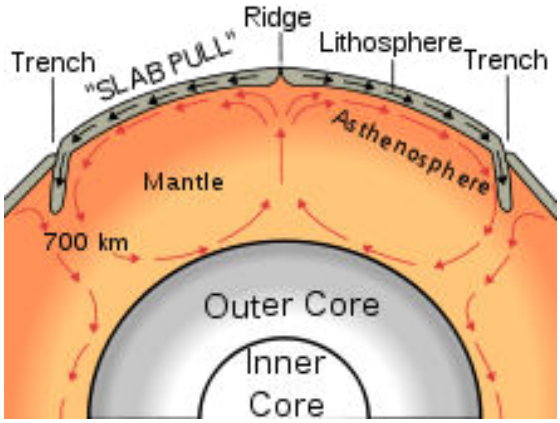
5. Describe the flow of energy and matter in the set-up.

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?

Part 2: Convection Currents in the Mantle

Read the provided Article and then answer the questions below.



Questions

1. What patterns did you notice in the mantle?

2. What caused the mantle to move the way it did? What was the effect of the mantle movement?

3. How would the movement be different if temperatures in the mantle increased?

4. Describe how the mantle is a system and how the mantle system interacts with the lithosphere.

5. Describe the flow of energy and matter in the asthenosphere.

6. How does the shape of the earth and influence the movement of the mantle rock?

7. What would happen if the earth's mantle temperature were to decrease?

8. How does this information about the mantle compare to the lab you completed? *Cite evidence from Part 1 of this lab and from this reading selection in your response.*