#### CONVECTION LAB

#### Introduction:

Convection, it is the force that drives all of our planet's motion. From the deepest magma to the slightest breeze in the air brushing our skin, the force behind the movement is convection. Convection is one of the ways that heat moves in a fluid.
In the ocean, convection currents are responsible for the mixing and movement of the waters around the globe. In this lab we will be observing convection currents modeled with hot and cold water and food coloring.

**Question**: How does air move during convection in the Earth’s environment?

Hypothesis:

* I hypothesize if air is warmed in the atmosphere, it moves \_\_\_\_\_\_\_\_\_\_\_\_\_ in relation to the colder regions because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* I hypothesize if air is cooled in the atmosphere, it moves \_\_\_\_\_\_\_\_\_\_\_\_ in relation to the warmer regions because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Materials:**

|  |  |
| --- | --- |
| **Part of Model**  | **Real thing it represents**  |
| Bottom of the cake pan  |  |
| Water in the cake pan  |  |
| Air above the cake pan  |  |
| Bag of Ice  |  |
| Candles  |  |

**Procedure:**

1. Fill the with .
2. Place the three , on the lab table, forming a that the can rest on and remain . Place the on the .
3. Light the and place them underneath of the This end of the represents of the earth.
4. Put some in the large Ziploc and place the in the on the side the . This end of the represents the of the earth.



5. After the has rested for a few minutes, place several drops of in a along the , near where it the water.

6. Carefully place of into the in a along the of the directly above the .

7. Watch the of the and answer the following questions.



Data:

Describe what happened here in 2-3 COMPLETE sentences.

Conclusion and Reflection Questions:

1. On the diagram, please label the movement of the food coloring.
2. What can you conclude about the density of the water near the candle as compared to the density of the water near the ice? Where is the water more dense? Why?
3. As you fly around in the “air” (the water in the cake pan), near the top of the troposphere, where do you feel the highest water pressure, near the ice or near the candle? Why?
4. On the diagram of the cake pan (previous page), place an “H” where the pressure aloft (i.e. near the top of the water) is highest and an “L” where the pressure aloft (i.e. near the top of the water) is lowest.
5. As you walk around on the “ground” (the bottom of the cake pan), where do you feel the highest water pressure, near the ice or near the candle? Why?
6. Please describe below in 2 – sentences how air convection occurs in the atmosphere.