

CONVECTION CONNECTION

How does temperature affect density?

You will first be exploring how when a substance is at different temperatures, it has different densities. This is an important piece to understanding how convection currents work.

Read the directions and identify the following:

IV:

DV:

Control Group:

Hypothesis:

Directions:

1. Get three beakers and fill each halfway with room temperature water.
2. Get a dropper of room temperature water (dyed green).
3. Release a small amount of this water (green) in the middle of the first beaker. Record your results.
4. Get a dropper of hot water (dyed red).
5. Release a small amount of this hot water (red) at the bottom of the second beaker. Record your results.
6. Get a dropper of cold water (dyed blue).
7. Release a small amount of this cold water (blue) at the top of the third beaker. Record your results.
8. Pour the water from your beakers into the class waste bucket.

| Independent Variable | Results | | |
|----------------------|---------|---------|---------|
| | Trial 1 | Trial 2 | Trial 3 |
| | | | |
| | | | |
| | | | |



Glue this side into your notebook



1. What is the **claim** you can make about **the relationship between temperature and density**, based on the patterns you noticed?

2. What **evidence** do you have to support this claim? (*List data for all three levels of your IV.*)

3. How does this pattern apply to:

The air in the atmosphere?

The water in the oceans?

The magma inside of the Earth?

2. What happens to temperature deep inside of Earth? What did you see in our model to represent that?

3. How does the temperature inside of the Earth affect the magma's density and what does that magma do?

4. What happens to the temperature as magma gets closer to the surface (crust) of the Earth? What did you see in our model to represent that?

5. How does that temperature affect the magma's density nearer to the surface of Earth and what does that magma do?

6. Define what a **convection current** is, based on all of the evidence gathered in this lab.

How does the temperature of the earth make convection currents happen inside?

Now you will watch a demo that simulates how convection currents work inside of Earth.

1. Draw a sketch, using labels and color, to represent what you saw in the demo.



7. Draw convection currents inside of the Earth in the **asthenosphere (upper mantle)**. (*Note: they also occur in the outer core!*) Include temperature descriptions and density descriptions.

***Add something about transfer of energy = heat

