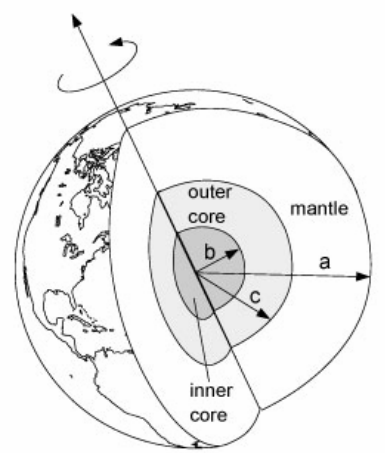
Name_____

Observing Convection Currents

Background Information:

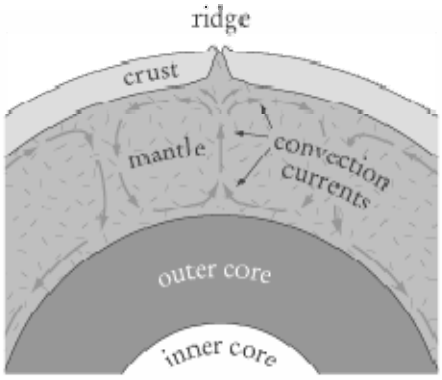


http://geomag.usgs.gov/images/earth.jpg

The Earth is divided into layers. The **asthenosphere** is the liquid mantle. The **lithosphere** is the crust. The lithosphere floats on the asthenosphere (the crust floats on the mantle) like ice on water. A **tectonic plate** is a piece of the Earth's crust (or lithosphere). The surface of the Earth consists of seven major tectonic plates and many more minor ones.

http://img.sparknotes.com/content/testprep/bookimgs/act/0016/convection_currents.gif

Because the earth is extremely hot inside, a current of heat flows through the **magma** from the **core** to the crust. This movement of heat is called **convection.** Convection also takes place in the mantle in a **current**. This convection current starts out as very hot magma near the core, and cools down as it moves closer to the crust (surface) of the earth. Because of this cooling, the rising up of the current decreases and the convection current begins to move in a horizontal direction along the beneath the crust. When the current of magma cools down even more, the convection current sinks again and goes to the inner earth. There the temperature increases and the current rises again. This goes on and on in a somewhat circular pattern. One complete current takes about 200 million years. The convection current moving along the bottom of the crust causes the movement of the tectonic plates of the crust.



Materials:

Matches	Tea candle	Tray	Goggles

SAFETY FIRST!

Tie back long hair.
Goggles are required!

Procedure:

1. Light the candle.
2. Allow the candle to burn for a few moments; you should have several pieces of soot in the melted wax.
3. Observe movement in the melted wax surrounding the bottom of the candle flame.
4. Record a minimum of 10 observations.
5. After you have made your observation, blow out the candle.

Data:

Observations of Movement	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Data Analysis:

1. Did you see particles of soot moving in the melted wax?

2. What happened to the particles of soot in the wax next to the candle wick – did they float **across** the melted wax just beneath the surface, or **under**, on the bottom of the candle wax?

3. When the particles of soot sank, was it near the wick or the edge of the candle?

4. Where is the coolest part of the candle – wick or edge?

    a. How does the answer to question 4 help explain this movement of the soot?

5. Did the particles of soot seem to return to the wick?

    a. Which way – on top of the wax, or under, on the bottom of the wax?

    b. How does the answer to question 4 help explain this movement of the soot?

6. Draw two diagrams show the movement of soot particles in the wax using arrows. Diagram a side view and an aerial view.

Side View	Aerial View

Conclusions:

1. What type of heat transfer is demonstrated in this activity?

2. Where in the Earth's layers does this kind of movement occur?

3. What is moved along the top of these currents on the Earth?

4. Write a brief paragraph explaining the relationship between convection currents in the mantle and the movement of tectonic plates.