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Conceptual Physics: _____
Date: _____

Unit X
Geophysics
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Convection Lab

Problems: How does convection occur in fluid materials? What does convection have to do with our study of the Earth's makeup?

Materials:

Each student group will need a large pyrex beaker (1000 mL), room temperature water, a small sample of potassium permanganate (KMnO_4) in a piece of filter paper held closed by a paper clip, a hot plate, goggles and aprons. *Caution: Potassium permanganate is a strong oxidizer and when mishandled can cause explosions. KmnO_4 will stain skin and clothing.*

Procedure:

Place about 500 mL of room temperature water into the beaker. Set the beaker on the hot plate and allow the water to adjust and stabilize for a minute, then lower the weighted filter paper containing the KmnO_4 into the water at one side of the beaker. It should sink to the bottom of the beaker. Observe the packet while counting to 60. Then turn on the hot plate while continuing to observe the beaker. Make careful observations of what happens.

Data: Make careful drawings of the situation that occurs before, during, and after heating in this lab.

Before heating	During heating	After heating
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Conclusion Questions:

1. Why does the water move upward when it is heated?
2. Is water moving upward, or is it just the KmnO_4 crystals?
3. What occurred during the time when the water was not being heated?
4. How does our observation relate to our study of Earth's structure (i.e., What role do convection currents play in such phenomena as earthquakes and volcanoes and the rock cycle?)
5. What layer of the Earth is cycling because of convection currents?
6. What is the very long term result caused by Earth's convection currents?