



California State University of Bakersfield, Department of Chemistry

Colorful Convection Currents



Standards:

K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.

MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.

Introduction:

What is convection? Weather forecasters show how convection currents are formed when warm and cold air masses meet in the atmosphere. Convection currents are responsible for warm water currents that occur in oceans. Does the placement of the hot and cold water determine how they will mix?

Materials:

- 4 empty identical bottles, mouth of the bottle should be at around 1 ½ inches in diameter. (you can use regular water bottles if you need too, but not recommended)
- Warm/hot and cold water
- Yellow and Blue food coloring
- 3 x 5 inch index cards

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Safety:

- Always have an adult with you to help you during your experiment.
- Always wear eye protection and gloves when doing chemistry experiments
- When doing this experiment consider the fact that some water might spill, so complete over a sink or pan.

Procedure:

1. Fill 2 of the bottles with cold water (use blue food coloring)
2. Then fill the last 2 bottles with warm water (yellow food coloring)
3. HOT OVER COLD: place the index card over the mouth of one of the warm water bottles. Hold the card in place then, turn the bottle upside down and rest it on top of one of the cold water bottles. The bottle should be positioned so that they are mouth to mouth with the card separating the two liquids.
4. Carefully slip the index card out from in between the two bottles. Make sure that you are holding onto the top bottle when you remove the card. Observe what happens.
5. COLD OVER HOT: repeat steps 3 and 4, but this time place the cold water bottle on top of the warm water. Observe what happens.

Data and Observations:

1. Record your observations here.

Questions:

2. Why did the water mix when the cold water was on top?

References:

1. "Steve Spangler Science." *Colorful Convection Currents*. N.p., n.d. Web. 18 July 2014.