LET'S GET CHEMICAL

DAY TWO: BUBBLE TROUBLE

4-H STEM

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BUBBLE TROUBLE

Welcome to Let's Get Chemical Day Two!

Today, you are going to make your own lava lamp and discover how groovy cheistry can be! This experiment will allow you to explore the relationship between water and oil in terms of density and you will observe a chemical reaction between an acid and a base! For more information or to learn more, check out this video! https://youtu.be/JbaScpYu8Vs

How Does it Work?

Oil and water do not mix because they cannot form any chemical bonds with each other. Water is made up of highly charged, hydrophilic compounds ('water loving') while oil is made up of long chains of carbon that are hydrophobic ('scared of water'). The long chains of carbon that make up oils do not carry a charge and are not attracted to water molecules. This causes the seperation between water and oil that you will see in this experiment.

In addition to the water and oil seperating, the density of water and oil will cause them to seperate a specific way. Density is a measure of mass per volume. It is what we use to describe how much space a substance takes up in relation to its mass. When the water and oil are resting in your bottle for this experiment, you will notice that the oil floats on top of the water. This is because oil has a higher density than water.

Seltzer tablets are both acidic and basic! The tablets contain sodium bicarbonate (a base) and citric acid (an acid) which, when mixed with water, react with each other and produce bubbling carbon dioxide. This creates the bubbles you see within the colored fluid in the soda bottle.

Vocabulary

- Oil and Water Mixture: oil, a hydrophobic compound, and water, a hydrophilic compound, do not mix.
- Acid-Base Reaction: A chemical reaction between two substances where one is an acid and one is a base.
- Hydrophobic Compound: A 'scared of water' compound that does not dissole easily in water.
- Hydrophilic Compound: A 'water loving' compound that easily bonds with water.

Materials:

- One clean, plastic soda bottle
- Oil (vegetable oil, baby oil, etc.)
- Seltzer tablets
- Food coloring
- Water

Instructions:

- Fill plastic bottle 3/4 full of oil
- Add water to the neck of the bottle. Leave space below the top of the container.
- Add food coloring until the water becomes a rich color.
- Break the seltzer tablets into medium sized pieced.
- Add pieces one at a time and observe what happens.
- When the bubbling slows down, put the cap on the bottle.
- Tip, twist, and shake the bottle different ways and observe what happens.

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Resources: Education.Com Homeade Lava Lamp

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