



TRY IT AT HOME: LAVA LAMP

Objectives

Learn about molecular polarity while making a fun art project!

Principle of Humanism Supported by Lesson

- ★ *We are committed to the arts as a form of human expression.*
- ★ *We use reason and science to seek natural explanations to events in the universe and to solve problems.*

Materials Needed

Veggie Oil
Water
Drinking Glass, Container, or Clear Soda Bottle
Food Coloring
Alkaseltzer

Differentiation for Age Groups

This activity is great for all ages, but our youngest campers may want some help from their caring adults.

Older campers that want to dive deeper into the chemistry can check out these links:
<https://www.stevespanglerscience.com/lab/experiments/bubbling-lava-lamp/>
https://kids.kiddle.co/Polar_bond

Activity Instructions

Learn!

The oil stays above the water because the oil is lighter than the water or, more specifically, less dense than water. The oil and water do not mix due to something called intermolecular polarity: meaning that water molecules are only attracted to other water molecules and the oil molecules are attracted to other oil molecules. The structures of the two different molecule types do not allow them to bond together. Water molecules are considered polar molecules and oil molecules are considered nonpolar molecules.

When you add the alka seltzer pieces, it sinks to the bottom and reacts with the water and creates a gas. As the gas bubbles rise, they take some of the colored water with them. When the blob of water reaches the top, the gas escapes and water sinks back down.

Create!

- 1) Fill $\frac{1}{4}$ of your glass or bottle container with water
- 2) Fill most of the rest of the container with oil, allow some time for the oil and water to settle
- 3) Add about 10 drops of food coloring into your container, observe that only the water changes the color and not the oil
- 4) Break the alka seltzer tablet into a couple different pieces and drop them in the container
- 5) Watch the magic start to happen!
- 6) Add more pieces of alka seltzer to keep the effect going

Exploration

What happens if you put different color drops in? Do they stay separate?

How do different container shapes affect the patterns?

How does varying amounts of alka seltzer affect the patterns?

Do different temperatures of oil and water affect the patterns?

Additional Resources

Search for "oil water food coloring lava lamp" on youtube for some awesome examples.