



STEAM Challenge: DIY Lava Lamp

Materials:

- Water
- Vegetable Oil
- Food Coloring
- Alka Seltzer Tablets
- Plastic Bottle

Directions:

1. Fill the plastic bottle about $\frac{2}{3}$ full with vegetable oil.
2. Fill the rest with water. Be sure to leave a little space at the top.
3. Add the food coloring. Note: The food coloring will only mix with the water, not the oil. You can stir the solution with a chopstick or straw.
4. Break the Alka Seltzer tablet into four pieces. Drop one piece of the tablet into the bottle at a time.

The science behind Lava Lamps:

A lava lamp works because of density and polarity.

Density is the measurement of how compact a substance is or how much of it fits in a certain amount of space. When you poured the water into the bottle, you may have noticed it sank to the bottom. That is because water is more dense than oil.

Polarity prevents the oil and water from mixing together. Water molecules are “polar” and attract other atoms. Oil molecules, on the other hand, are non-polar and not attracted to the water molecules. This is why oil and water don’t mix.

The Alka Seltzer tablet sinks to the bottom, reacts with the water, and starts dissolving. As it dissolves, it forms gas(carbon dioxide) bubbles. These stick to the water droplets. Since

the colored water and gas combination is less dense than the oil, it rises to the top of the bottle.

At the top of the bottle, the gas bubbles pop, releasing the colored water to sink back to the bottom again.

STEAM Challenge:

1. What happens if you drop a whole tablet in?
2. When it stops bubbling, try sprinkling some salt into your lava lamp. What happens?

Further Learning:

[Crafty Science by Jane Bull](#)

[Simple Science Projects by Kelly Milner Halls](#)

[STEAM Lab for Kids by Liz Lee Heinecke](#)

YouTube Video Link: <https://youtu.be/aU87I5pU420>