

DIY Lava Lamp

6th - 8th
Grade

Materials



Clear bottle

Water

Food coloring

Vegetable oil

Alka-seltzer



Students will learn about density and polarity as they make their own lava lamp.

Directions

1. Find a clear bottle (you can recycle a used water bottle for this) and fill it about $\frac{3}{4}$ of the way with vegetable oil.
2. Fill the rest of the bottle with water and leave a little room at the top to reduce the risk of spilling. The water will sink to the bottom.
3. Add a few drops of any color food coloring that you have. Food coloring is water based and will sink to the bottom as well.
4. Break an alka-seltzer tablet into smaller pieces and drop them in one at a time.
5. Observe and keep the lid off until the reaction is done!

The Science

The lava lamp created in this experiment is able to work due to the principles of density and polarity. **Density** is the degree of compactness of a substance. In other words, it's a measurement of how much of a substance fits in a certain amount of space. If you were to measure out an equal volume of oil and water, you would find that the water is heavier than oil. This is because water molecules are packed more tightly in water, giving it more mass, and this causes the water to sink to the bottom in our experiment. When we add the alka-seltzer, it reacts with the water to produce Carbon Dioxide gas bubbles that stick to the water droplets and cause them to rise. Did you notice that even though the water and oil are touching, they aren't mixing together? This has to do with **polarity**. Water molecules have 2 positively charged hydrogen atoms and 1 negatively charged oxygen atom. Like a magnet, the positive and negative ends of each water molecule will be attracted to one another (meaning they are **polar**). Oil molecules lack a positive or negative charge and are nonpolar. They are not attracted to water molecules and this is why oil and water won't mix!

