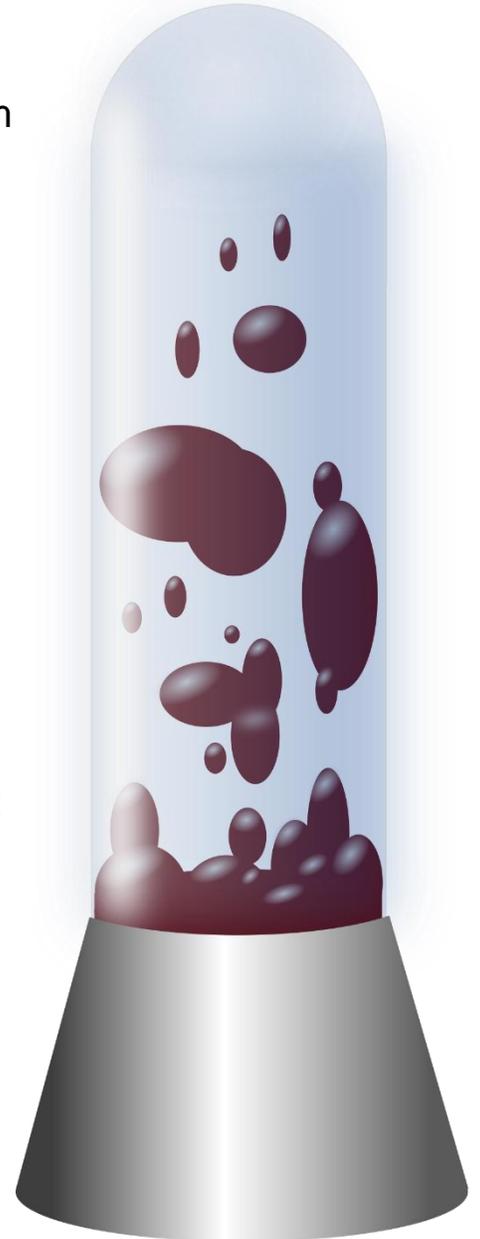


# Lava Lamp

## What it's about:

- **Density** - *Density* is how much of something you have in a given space. For example, a brick weighs much more than a piece of foam that is the same exact size. We say that a brick is more *dense*. A cup of salt water weighs more than a cup of plain water, because of the extra salt. The salt doesn't take up any extra space, so it makes the liquid more *dense*. Even air has *density*! If you fill up a balloon with air and place it on a very sensitive scale, you will see that it will weigh more than an empty balloon on the same scale. Of course, air is much less *dense* than most substances that we usually encounter; water is more than 800 times more *dense* than it. That means that if you take a balloon of water and place it on a balance scale, it will take a balloon of air that is **800** times its size to balance it.
- **Gases** – Gases are fluids, like water, but much less *dense*. Air is one type of *gas*. Oxygen, carbon dioxide, hydrogen, helium and nitrogen are also types of gases when they are at room temperature. In fact, air is just a mix of many different gases.
- **Buoyancy** (*boy-un-see*) – *Buoyancy* means that less *dense* objects float in fluids that are more *dense*. Water tubes float on water because they are less *dense* than water; they are *buoyant* (*boy-int*) in water. Bricks will sink when placed in water, because they are more *dense* than water. Oil is only 90% as *dense* as



water. This means that 9 cups of water weigh as much as 10 cups of oil. This is why oil floats on top of water! Helium is less *dense* than air, so when it is placed in air, it has *buoyancy*. That's why helium balloons can float in air. This is also why fizz rises to the top of soda.

- **Polarity** (*poe-lah-rih-tee*)– Water molecules are *polar* because they have a lopsided electrical charge. What this means is the water molecule has opposite electrical charges on each end. One end of the molecule has a strong negative charge, and the other side has a strong positive charge. These electrical charges work like magnets, where negative charges are attracted to positive charges. Therefore, water sticks to itself! Little twigs can actually float on water for this reason, even if they are more *dense* than water. Oil is not *polar*, so when an oil molecule gets in between two water molecules, the two water molecules “squeeze” it out. This is why water and oil can't mix, no matter how hard you try. Water's *polarity* allows it to do something else as well: It can break apart loosely bound molecules by “pulling” or “pushing” electrically charged pieces of the molecule away from the rest of it. For this reason, common chemical reactions are performed using water. The water breaks apart the compounds that are placed in it, and the free atoms reconnect to form new substances. For example, Alka-Seltzer tablets placed into will water break apart. One of the new substances formed is carbon dioxide, which is a *gas* at room temperature.

