

## DIY Lava Lamp

There are 2 main ways to make your own lava lamp. Choose a method and watch what happens! Write an explanation of your observations using science facts.

### 1. The first way uses water, oil and salt -

[https://www.youtube.com/watch?v=2TSFt\\_PjsGA](https://www.youtube.com/watch?v=2TSFt_PjsGA)

Fill a tall jar about 2/3 way with water and 1/3 with vegetable oil, leaving a little space at the top. Add a drop of food colouring. Sprinkle salt into the mixture for 5 seconds and observe what happens.

### 2. The second way uses water, oil and an antacid tablet (adult supervision required)-

Fill the jar 1/3 full of water and 2/3 full of oil, leaving a couple inches at the top of the jar. Add a drop of food colouring then add an antacid tablet to the mixture and observe what happens.

## The Science Behind It

These lava lamps work because oil and water have different densities and polarities so they don't mix.

### Density

Oil is less dense and water is more dense. That means for the same volume, the water has more mass (weight) than oil. Since oil is less dense, it floats on top of water.

### Polarity

The second reason oil and water don't mix is because of polarity. Polarity means a molecule has a positive charge at one end and a negative charge at the other. Water is a polar molecule.

Oil molecules are non-polar and only have a shell of negative charges.

Only other polar molecules can dissolve in water because polar molecules dissolve only in polar solvents and non-polar molecules dissolve only in non-polar solvents. And so non-polar oil will not dissolve or mix into polar water.

### Adding Salt

When salt is added to the top of the oil, it is heavier than the oil and water and sinks to the bottom of both layers. As it passes through the oil layer, oil sticks to the crystals and is carried as a blob through the water layer to the bottom of the jar. As the water dissolves the crystalline salt, the oil is released and, because it is less dense than the water, it floats back up, creating the lava lamp effect.

### Adding Antacid Tablets

The antacid tablet sinks to the bottom where it reacts with water to produce carbon dioxide gas. These gas bubbles rise to the top and take some of the colored water along for the ride. The gas escapes when it reaches the top and the colored water falls back down.

The antacids fizz because they contain citric acid and sodium bicarbonate (baking soda), the two react with water to form sodium citrate and the carbon dioxide gas bubbles.