



## LAVA IN A CUP!



Mom Inspired Life

**Lava lamps were originally created by a British inventor in 1963, 57 years ago! Real lava lamps use wax and heat in order to create the "lava" effect, but with these experiments, you'll be able to use water and oil to get the same look at home!**

### MATERIALS:

- A clear cup or glass
- Water
- Mineral oil (vegetable oil also works, but has a yellow color to it)
- Food coloring
- Alka Seltzer OR salt (see page 2 for the alka seltzer method and page 3 for the salt method)

## MAKE A LAVA LAMP with ALKA SELTZER

### INSTRUCTIONS:

- Fill 1/4 of your cup with water.
- Add a couple drops of food coloring to the water and mix.
- Fill the rest of your cup with the oil of your choice, leaving an inch at the top. You should see that the oil sits on top of the water, and won't mix.
- Break up an Alka Seltzer tablet into smaller pieces.
- Add a piece into the glass. What happens?

You should see that when the Alka Seltzer is added, it starts bringing bubbles of the colored water to the top, only for the bubbles to fall back down again. Why is this happening?

### HOW DOES IT WORK?

Both real lava lamps and our lava-in-a-cup work because of *density*. Density is how many molecules of something that's in a given space; if something is heavy and small, it is very dense. Naturally, water is more dense than oil. When Alka Seltzer touches water, a *chemical reaction* happens. The Alka Seltzer releases *carbon dioxide* ( $\text{CO}_2$ ) through little bubbles of gas. The water grabs on to these bubbles, and with the  $\text{CO}_2$ , becomes less dense and floats to the top. Once it reaches the top, the  $\text{CO}_2$  escapes. The water becomes dense again, and sinks to the bottom of the cup.



### OTHER QUESTIONS TO EXPLORE

- How many times can you add Alka Seltzer to the cup?
- Does the amount of Alka Seltzer change how it looks?
- Do different food oils give different effects?
- Does the shape and height of the glass or cup matter?

## MAKE A LAVA LAMP with SALT

### INSTRUCTIONS:

- Fill the glass 3/4 full with water.
- Add a couple of drops of food coloring to the water and mix.
- Slowly pour 1/4 of a cup of oil on top of the water; you'll see that the oil floats.
- Sprinkle a teaspoon of salt on top of the oil. What happens?
- To repeat the effect, add more salt once the oil stops moving.

You should see that when the salt is added, blobs of oil move up and down the cup. Why is this happening?



### HOW DOES IT WORK?

Both real lava lamps and our lava-in-a-cup work because of density. Density is how many molecules of something that's in a given space; if something is heavy and small, it is very dense. Naturally, water is more dense than oil. Salt is also more dense than oil. When the salt is added to the top of the cup, it sinks down to the bottom, taking some of the oil with it. Once it reaches the bottom, the salt *dissolves* into the water around it. With no more weight to hold it down, the oil floats back up to the top!

### OTHER QUESTIONS TO EXPLORE

- Would any other substance besides salt work? Sugar? Sand?
- How long will the effect keep going on if you keep adding salt?
- Do different food oils give different effects?
- Does the shape and height of the glass or cup matter?

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- For more experiments and explanations of density, visit [Explora for Grades K-8](#) and search "density experiment".
- For fun books about science, visit [TumbleBooks](#) and search "science".
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**These experiments were inspired by projects highlighted on Science Bob and Home Science Tool's websites:**

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