

Density Lava Lamps

Equipment (Get this ready before you start)

Plastic Bottle (with lid for storage)

Vegetable Oil (enough to 3/4 fill your bottle)

Water

Food colouring (liquid not gel)

Alka Seltzer Tablet (or any effervescent tablet)

Optional: Glitter, small sequins



Method

- 1) Fill your bottle 3/4 full with the vegetable oil.
- 2) Add water to just below the top of the bottle
- 3) Wait 2 minutes for the layers to fully separate out.
- 4) Add 8-10 drops of food colouring - watch as the travel down through the oil, not mixing with the water.
- 5) Optional: Add a bit of glitter.
- 6) Break your Alka Seltzer tablet up in to small pieces
- 7) Drop 1 small piece of tablet in at a time and watch your lava lamp come to life.
- 8) Do NOT put the lid on the bottle during the experiment.
- 9) Take it in to a dark room and shine a torch underneath it as it reacts to see it glow.
- 10) When you have finished you can store the lava lamp by putting the lid on and it will be good to use another day.

Spectacular Science!

The oil and water have different densities, so the oil sits on top of the water and doesn't mix in with it due to something called polarity (look this up if you would like to know more). The liquid food colouring is water based, so it sinks through the oil to mix with the water below. The tablet is also more dense than the oil so again it sinks through the oil to the water. When the tablet hits the water, it reacts to produce bubbles of carbon dioxide which stick to the water droplets. The water and gas combination is less dense than the oil, so they rise to the top of the bottle. At the top, the gas bubbles pop and escape out of the bottle in to the air leaving the water, which is more dense than the oil, to sink back down again. Fancy taking it further? What happens if you add more/less of the tablet? If you use warm water?

Don't have Alka Seltzer? You can use vinegar instead of the water and put a spoon of bicarbonate of soda in the top - the science is the same 😊