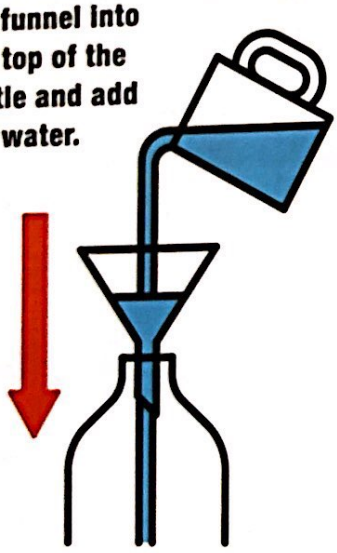
THE 1970S LAVA LAMP

Back in the 1970s, everyone had one of these lamps that produced craaaaazy psychedelic effects. Here's how to make your own.

You Will Need

- clear, empty 1-liter soda bottle
- plastic funnel
- half a cup of water
- bottle of vegetable oil
- liquid food coloring
- one or two effervescent tablets (people take these for headaches with an upset stomach)

1 Put the funnel into the top of the bottle and add the water.



2 Pour in the vegetable oil until the bottle is nearly full.

3 Wait for the water and oil to separate (see What's the Science?).

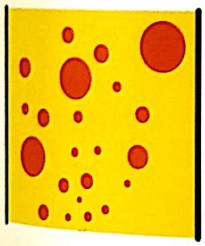
In the Real World

When a tanker runs aground and spills its oil into the sea, the oil floats on top because it isn't as dense as the water.

4 Add about 10 drops of food coloring and wait until it falls through the oil to the water at the bottom.

5 Break one of the effervescent tablets into small pieces and drop one into the bottle.

6 As the tablet starts to fizz, bubbles of colored water will begin to rise up through the oil.



7 Dim the lights and shine a flashlight into the bottle from the side.

8 When the bubbling stops, add more fizz to re-start the show.

9 For an even fancier lava lamp effect, add some glitter into the mix—this will add a sparkling, star-like shimmer.

Take it Further If you have a glass table, make your lamp look even more fantastic by placing it on the top and shining a powerful flashlight from underneath. Turn the lights off for a spectacular show!

What's the Science?

Oil and water don't mix because the molecules that make up each one are more attracted to each other than they are to the molecules in the other substance.
Oil is more viscous than water, but it isn't as dense—so it "floats" above the water. The food coloring is water-based, so it sinks to the bottom. When you add the tablets they release bubbles of carbon dioxide and these give the colored water a piggyback ride to the surface. The bubbles burst, the gas escapes, and the colored water drifts back down to the bottom of the bottle again.

LAVA LAMP 2.0

Bubbles and blobs make for a mesmerizing reaction.

If you ask your grandparents about the original lava lamp, they just might get a faraway look in their eyes thinking about the groovy days of the 1960s. But if you want to really blow their minds, show them this simplified version and explain the science behind it. It all comes down to a scientific principle demonstrated every day by the salad dressing in your fridge: oil and water don't mix.

MATERIALS

- **Pint-size (or larger) mason jar with two-piece lid***
- **Water**
- **Food coloring**
- **Vegetable oil**
- **Effervescent antacid tablets (such as Alka-Seltzer)**

**A larger jar gives more dramatic results.*

INSTRUCTIONS

1. Fill the jar about a quarter full with water. Stir in 10 or so drops of food coloring.
2. Add twice as much oil as water, so the jar is three-quarters full.
3. Drop in half of an antacid tablet and observe the reaction.

SCIENCE IN REAL LIFE

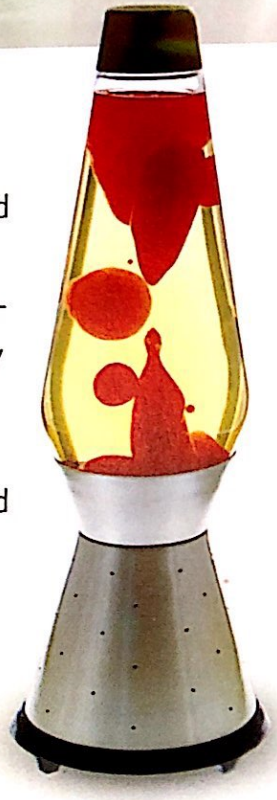
When oil spills in the ocean, clean-up crews use floating barriers to keep the oil slick contained. They can do this because the oil is floating on the water's surface, just like the oil in this lava lamp.

What to Watch For

The tablet should start to bubble, causing blobs of colored water to rise up into the oil. Once the initial bubbling slows down, watch as smaller bubbles continue to rise and fall, or add more antacid, broken into smaller chunks.

When you are done, let the jar sit uncovered for a while so all the gas can escape. (Trapping that gas in the jar could cause it to crack!) Store the jar with the lid on, and keep some antacid tablets handy, so you can use your lamp on another groovy day.

What's Going On



The original lava lamp used heat to send mesmerizing blobs of wax rising and falling. Here, we use the gassy fizz from an effervescent antacid tablet. The oil is less dense than the colored water so it floats in a layer on top (for more on density, see Tower of Liquids, page 110). The blobs of water are carried to the surface by the rising carbon dioxide bubbles, and then sink back down when the bubbles reach the top.

SPEAK like a SCIENTIST

A material that bubbles or foams from escaping gas is called effervescent. Antacid tablets are effervescent in the same way that baking soda is when you mix it with an acid such as vinegar. In fact, the tablets actually contain baking soda (sodium bicarbonate) along with citric acid, so when the tablet is dissolved in water, you see a similar reaction: lots of bubbles of carbon dioxide gas. (See Take It Further, page 104.)