



What you'll need

Special materials

Alka-seltzer tablets or fizzy vitamin tablets can be bought from most chemists or supermarkets. These dissolve in water and release bubbles of gas. You'll need these for the lava lamp section of the activity.

- Large container for water, a bucket, plastic tub or even a mixing bowl. Or you can use the kitchen sink or even do the activity in the bath.
- Collection of objects to test whether they float or sink. For example cutlery, cookie cutters, fruits and vegetables. It's a good idea to have different sized versions of the same thing, like tomatoes. You could also test the same thing made from different materials, like a plastic spoon and a metal one.
- Oranges or lemons or grapefruits
- Tin foil (to illustrate density)
- Can of soft drink and a can of diet version of same drink
- A tall glass or empty, clear plastic bottle for the lava lamp
- Some vegetable oil.
- A few drops of food colouring
- Water
- An alka-seltzer tablet or a fizzy vitamin tablet.

What to do

Test whether things float or sink – Take one object at a time and ask your child/children to predict whether it will sink or float.

Demonstrate the idea of density – Loosely roll up some tin foil into a ball. Try it out in the water (it should float). Squeeze the ball up as tightly as you can, giving it a real squashing as Olympia does in the video. Then ask your child or children what they think will happen and why. Try it out. If you've squashed it tight enough, the tin foil should now sink because even though you have the same amount of tin foil, you've decreased its volume and increased its density.

Try out citrus fruits – See what happens to a citrus fruit when it has its skin on and then when it has been peeled.

Try out cans of original and diet versions of a soft drink.

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What to do (continued)

Make a lava lamp – Using the tall glass or empty bottle, fill it about a third full with water. Then top it up with vegetable oil. Add a few drops of food colouring. Wait for the colour to mix in with the water. Break an alka-seltzer or fizzy vitamin tablet into quarters. Drop a piece of the tablet into the glass and watch what happens. Add more pieces of tablet if you want more bubbles.

Questions to ask children

Before each activity: Before each activity: can you predict what will happen? Why do you predict that? (For example, can you predict what will happen when we squash the tin foil really tightly? Can you predict what will happen if we use metal spoon instead of a plastic one? Can you predict what will happen if we peel the fruit?)

Why does the diet drink float while the non-diet one sinks?

What do you think will happen when we pour the oil into the glass of water? Why?

What do you think is in the bubbles that are rising up in the lava lamp?

Why do you think they sink back down again?

The science

To understand why some things float and others sink, it's helpful to know about the concept of density. You can think of density as how 'compact' something is, or how much mass of something you have in a given volume. Density is defined as mass divided by volume. Something that is more dense than water will sink, something that is less dense will float.

The lava lamp works as Olympia describes it in the video. The alka-seltzer tablet reacts with the water to produce bubbles of gas. These are less dense than the water and oil

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The science

so they float to the top of both liquids, taking some water with them. When they reach the top of the oil, the bubbles burst, releasing the gas so that the water sinks back down through the oil.

Being safe

Alka-seltzer tablets contain sodium bicarbonate, aspirin and citric acid. They should not be eaten by children. The lava lamp contents should not be drunk.

Going Further

You can give your child or children a lump of plasticine and explore how to mould the plasticine into shapes that float. Discuss what the floating shapes have in common compared to shapes that sink.

The density of an object affects its buoyancy. You can learn more about this and how density affects whether something sinks or floats here: <http://bit.ly/Buoyancy>

You can try to make a 'density tower' by floating liquids of different density on top of each other, as shown in this video: <http://bit.ly/DensityTower>

Here's a quick lava lamp using fizzy water <http://bit.ly/FizzyLavaLamp>

