

Build a density tower

This multicoloured creation is a real game of sink-or-swim.

What you need

- 50ml each of runny honey, milk, washing-up liquid, water and vegetable oil
- Blue food colouring
- Tall glass jar
- Pipette (optional)
- Household objects (we used a Lego block, a games dice, a ping-pong ball and a cherry tomato)

TOP TIP

Drop objects into the tower as gently as possible. Try to avoid mixing up the layers too much. Let the upper layers settle completely between each release.

How does it work?

This colourful tower is a great demonstration of density. Density is a measure of how much matter a substance contains, for a given size. Dense materials pack in lots of mass, so feel heavier in the hand. You can test this out by weighing 50ml of each liquid on sensitive kitchen scales. Which weighs the most and which the least? Density affects how things float. Low-density objects float on higher-density substances. This is why oil floats on top of water. For a density tower to work you also need to use "immiscible" liquids that won't mix. Each object that you drop into the tower finds its natural level. Whether an object sinks or floats depends on its density. Can you predict where an object will float before you drop it in?



1 Gather the different liquids and the big glass jar. Mix some food colouring into the water so that it turns blue.



2 Pour the honey into the jar first. Try to do it without any honey touching the sides. Next, pour the milk carefully into the jar.



3 Now add the washing-up liquid, water and the oil. Be extra careful when pouring the last two layers. You may want to use a pipette instead.



4 You can use your tower as a density tester. Drop household items into the liquid and see at what level they float.