

# Oil and water

## Materials

- Test tube and test tube rack (a jar or bottle also works well)
- Marble (or small rock)
- Water
- Small piece of plastic that floats on water (such as a bottle top)
- Vegetable oil
- Small piece of Styrofoam



## Instructions

1. Drop the marble into the test tube.
2. Half-fill the test tube with water.
3. Drop in the piece of plastic.
4. Pour oil into the test tube until it is almost full.
5. Place the piece of Styrofoam in the test tube.
6. Screw on the lid and look at what happens as the liquids settle into place.
7. Shake the tube and again watch the liquids and objects settle into place.

## What happens?

Vegetable oil and water do not mix very well and there are two layers in the test tube, with oil on the top and water on the bottom. The oil floats on top of the water because it has a lower density than the water. Density is the amount of mass in a given volume and it is a measure of how tightly packed the mass is inside a particular material.

The marble has the highest density of all the materials so it sinks to the bottom. The Styrofoam has the lowest density, so it floats on top of the oil. The plastic has a density somewhere between the oil and the water, so it becomes suspended between the two layers of liquids.

## Related activities

Using a large jar, half-filled with water and half-filled with vegetable oil, test a range of objects to find out if they float or sink in the liquids.

Use a tall glass or jar to make a 'density column' (there are many images of these available on the internet). You can carefully pour liquids that have different densities

into the jar to create layers. Try pouring these liquids in the following order: honey, dishwashing liquid, coloured water and oil.

### **Health and safety considerations**

- Choking hazards for young children (marbles and small pieces of plastic and Styrofoam)