

Name: _____

Date: _____

density

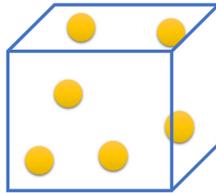
key words

mass how heavy something is
volume how much space something takes up

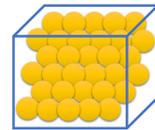
what is density?

All solids, liquids and gases are composed of atoms and molecules.
 Density describes how closely packed these atoms are in a solid, liquid or gas.

Large object
 +
 Small mass
 =
Low density



Small object
 +
 Large mass
 =
High density



solid densities

formula

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

We need to give density a number so that it is easier to compare different objects.



This potato has a mass of **100g**.
 It has a volume of **90cm³**.
 It therefore has a density of...

$$\frac{100\text{g}}{90\text{cm}^3} = 1.11\text{g/cm}^3$$

1 What is the density of this apple?



It has a mass of **100g** and a volume of **125cm³**.

Hint: you'll need the equation above (and maybe a calculator!)

real life research

Scientists used tiny particles called neutrons to look at the density of metal in Bronze Age swords. Using this information, they could see what type of combat they were used for: for example, stabbing or cut-and-thrust.



liquid densities

Just like solids, different liquids have different densities. We can demonstrate this by building our very own liquid density tower!

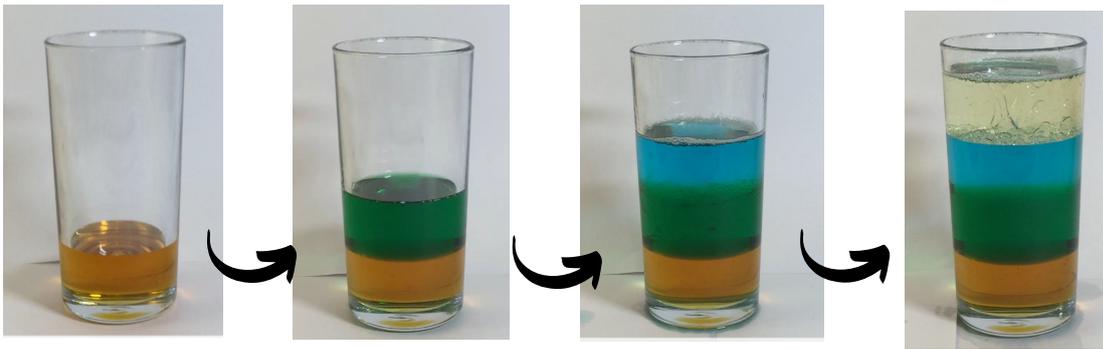
You will need...

- Tall clear glass
- Tablespoon
- Honey, dish soap, water, cooking oil
- Food colouring (optional - added to the water to make it easier to see)

Add each liquid as slowly as possible over the back of the tablespoon (this helps slow the flow). Try to avoid letting the liquids touch the side of your glass.



DO NOT DRINK YOUR DENSITY TOWER.



sink or float in water?

Water has a density value of 1g/cm^3 .

Any object which has a density greater than water will **sink**.

Any object which has a density less than water will **float**.

You could try adding different objects into your density tower. See if you can get one to float on each layer. For example, a cherry tomato? A ping pong ball?

2

Will an avocado sink or float in water? It has a density of 1.1g/cm^3 .

real life research



If a substance is a solid, it is usually denser than its liquid form. Ice is unusual because it floats on liquid water, a property crucial for life as we know it! Neutrons have been used to investigate why this happens.