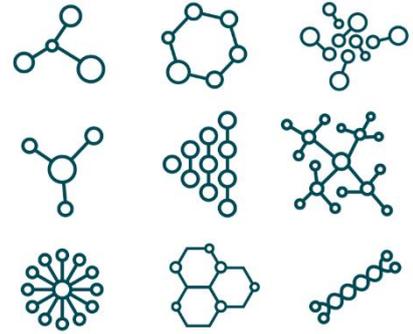


Liquid Layers

Every material in the universe is formed of tiny molecules. Molecules are arranged differently in each material.



“**Density**” describes how tightly a material’s molecules are arranged. Materials with tightly packed molecules are denser than materials with loosely packed molecules.

Density affects whether things float or sink. For example, a metal coin will sink in water as the molecules are tightly packed together – the coin is denser than water. A cork floats on water because the molecules are more spread out (corks have a lot of air inside them) – the cork is less dense than water.

You will need:

- Plastic cups (you’ll need 7 for a rainbow!)
- Food colouring
- Table salt
- Measuring jug
- Warm water
- A clear plastic straw



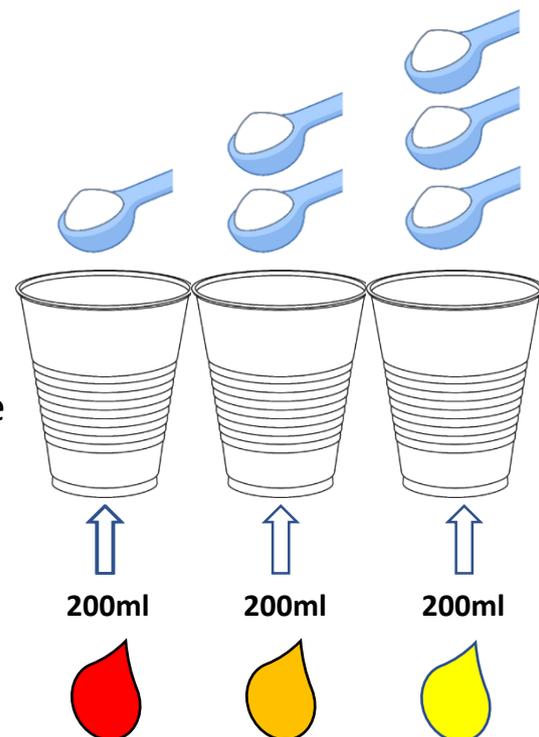
Always ask an adult for help with measuring and pouring.

Instructions:

1. Arrange the cups in a line. Pour 200ml of warm water into each cup. Dissolve 1 teaspoon of salt in the first cup, 2 teaspoons of salt in the second cup, 3 teaspoons in the third cup and so on.

2. Add a different colour of food colouring to each of the cups. Use red colouring for cup 1, orange for 2, yellow for 3, and so on.

3. Keeping both ends of the straw open, dip the end of the straw into the red water. Place your thumb over the open end of the straw and remove from the liquid. The water will stay inside the straw as long as your thumb is covering the opening.



4. Dip the straw into the orange water. Lift your thumb to bring water into the straw. Remember to cover the opening before removing the straw!
5. Repeat this process with each cup. You should have a liquid rainbow in your hand!

What's Happening?

Have you ever noticed that it's easier to float in seawater than in the bath?

Minerals from the Earth's rocks have been washed into the ocean over millions of years making seawater very salty. If we could somehow count every molecule in a litre of seawater and every molecule in litre of tap water, we would find a lot more molecules in the litre of seawater. This means that seawater is denser than tap water and so it's easier to float on it.

In this experiment we kept the amount of water in each cup the same but added more salt molecules to every cup. This gave us solutions of increasing density. The colours not only help us to remember the order of our solutions, they also make a wonderful pattern!

Where Next?

Try adding water in a different order. Why not start with the densest solution and work backwards? Or investigate your own order! Will the results be different?

Why not try using something other than salt to increase water density? Sugar also dissolves in water. Do you think the results will be different? Remember to keep the amount of water in every cup the same!