Water Ring

Stem Activities

Ages: 3-5

Less than 30 minutes

Grownup needed

Have you ever wondered why oil forms circles in water? This simple yet magical experiment will help you solve this puzzle! You'll experience the fascinating interaction between oil and water while exploring the amazing science of surface tension.

Materials Needed

Cooking oil
Glass bowl
Water
Dropper
Lolly stick
Colour powder (chalk dust)
Toothpick
Washing-up liquid

Step-by-step tutorial

Step 1

Using a lolly stick, mix some colour powder into the cooking oil until well combined.

Step 2

Pour water into the empty bowl.

Step 3

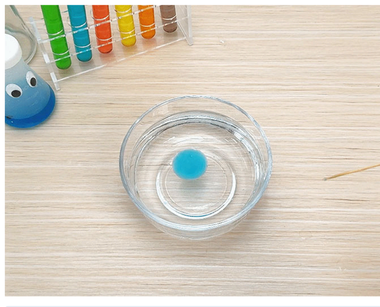
Use the dropper to draw up 3ml of coloured cooking oil.

Step 4

Drop the cooking oil from the dropper into the water.

Step 5

Dip a toothpick in washing-up liquid and touch it to the centre of the oil. Watch carefully as the oil spreads out from the toothpick, forming a beautiful ring.



The Science Behind It:

Why does oil form circles in water?

This relates to surface tension between molecules. Oil and water have different molecular structures that prevent them from mixing easily. Water molecules form strong hydrogen bonds, giving water high surface tension, while oil molecules tend to "self-aggregate". When oil contacts water, the attractive forces between oil molecules cause them to minimise contact with water, forming a circle to maximise molecular bonding whilst reducing surface area, reaching a stable state.

What does the washing-up liquid do?

Washing-up liquid is a surfactant. When added to the oil-water mixture, it reduces the surface tension at the interface, preventing oil molecules from clustering as tightly together, resulting in the ring formation.