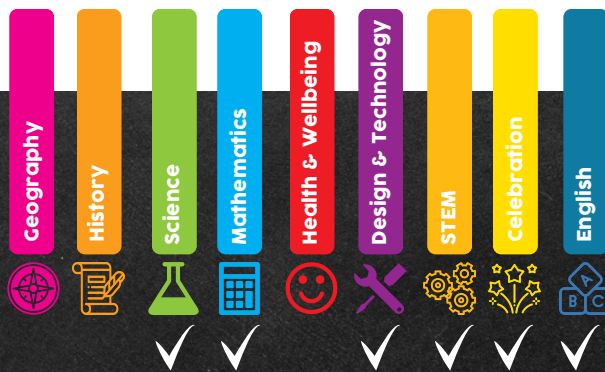


Supreme Incursions

Milk Art



Independent Inquiry



30 Minutes



Grades F-2= Basic Concepts
Grade 3+ More Complex Principles

This might just become one of your favorite kitchen chemistry experiments. Some unusual interactions take place when you mix a little milk, food coloring and a drop of liquid soap. Let's check it out!

The aim

- (Grades F-2) To understand that **chemicals** can react when combined.
- (Grade 3+) To learn about **hydrophilic, hydrophobic, polar and nonpolar molecules**.

What you will need

A shallow bowl or deep plate

1 cup of milk

Dish soap

Cotton swab x 2

Dye x 3+ colours

Optional - Pipette



Watch the video

Scan the QR code to watch the instructions



Follow these steps

- Step 1** Pour 1/2 cup of milk into a bowl/plate. Be careful not to move it, so that the milk is still.
- Step 2** Put one drop of each dye in different places around the bowl.
- Step 3** Put a small amount of soap on a cotton swab. Touch the swab tip on each dye (gently as not to disturb the milk).
- Step 4** Repeat this experiment, this time put all the dye colours very close in the middle of the plate (but not touching).
- Step 5** Using a new swab, cover in soap again and 'touch and hold' the tip of the swab in the middle. Watch as the colours fly outwards, changing colour as they go!

The Science behind it

- Soap molecules consist of a **hydrophilic** ("water-loving") end and a **hydrophobic** ("water-fearing") end.
- Water molecules are **polar molecules** that can dissolve other polar molecules.
- Fat (and oil) molecules are **nonpolar molecules**, that cannot dissolve in water.

Milk is a mixture of both the above molecules. When soap is added to it, it separates the **water** and **fat** in the milk! The hydrophobic end of the **soap molecule** breaks up the **nonpolar fat molecules**. The **hydrophilic end** of the soap molecule links up with the **polar water molecules**. Now that the soap is connecting the **fat** and **water**, the **nonpolar fat molecules** can be carried by the **polar water molecules**.