

Milk Magic

Create your own rainbow patterns in milk!



Grab this stuff:

- A** Whole milk
- B** Flat plastic tray
- C** Food colouring (red, yellow, blue and green)
- D** Washing-up liquid
- E** Cotton buds
- F** Pipettes

Milk Magic



1

Pour milk into a tray.



2

Use a pipette to put drops of food colouring in a circle near the middle of the tray.



3

Dip a cotton bud in washing-up liquid and then in the centre of the milk. Watch the colours swirl!

Milk Magic notes

Aims

- Predictions – think and pose questions such as, what happens when red and blue food colouring are mixed together?
- Observation skills – experiment and watch what happens.
- Scientific inquiry – exploring what happens when different materials are mixed together.
- Properties of materials – learn about surface tension.

Practicalities and preparation

- Test your food colouring beforehand. It should sit on top of the milk and not sink to the bottom.
- When repeating the experiment, ensure that all the food colouring and washing-up liquid have been completely removed, or the next experiment will be contaminated.
- Try putting cotton buds at different places in the milk.
- Don't stir the milk – just touch it with the tip of the cotton bud.

The science – an introduction

Milk is made up of water, vitamins, minerals, proteins and fats. When the washing-up liquid is added two things happen. First, the washing-up liquid lowers the surface tension of the milk so that the food colouring is free to flow throughout the milk. Second, the washing-up liquid makes the fats and proteins in the milk spread out. This happens very quickly, causing the liquid to swirl. The food colouring molecules bump together, letting us see the activity of the milk.

Discussion

- What colour do you think you will see when the red food colouring mixes with blue food colouring?
- Why do we see swirls in the food colouring? What is making the food colouring move?
- What happens if you use different types of milk, for example semi-skimmed, low fat or soya milk?
- What happens if you use water instead of milk? Will you get the same reaction?
- What would happen if you repeated the experiment but with washing-up liquid in place of the milk, and then dropped milk in afterwards? Would anything happen?

Extensions

Gently lay plain white paper on the surface and make a print of your colour swirls.

Links to real life

The human body's digestive system:

The bile salts found in the small intestine can be thought of as 'detergents'. They rearrange or emulsify the fats in our food, increasing their surface area, which then helps enzymes to break them down.

Links to the Science Museum

Galleries:

- Challenge of Materials

Further information

- Lava Lunacy
- Bubble Trouble
- Gravity-Defying Water