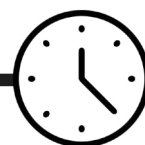


4. Separating oil and water



1
hours

Methods of separating a mixture of oil and water are investigated.

OBJECTIVES

- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating (Y5 Properties and changes of materials)
- Planning different types of scientific enquiries to answer questions

RESOURCES

Per group of 4

- Small transparent plastic bottle (approx. 200-400 ml) containing equal amounts of water and a coloured oil, e.g. corn oil
- A range of separating equipment such as:
- Clean, empty, plastic sauce bottle with one way valve, e.g. shower gel, tomato sauce
- Clean, empty, transparent, plastic detergent bottle Funnel
- Tubing
- Flexible plastic drinking straw
- Small transparent pump action dispenser bottle Plastic cups
- 2-3 plastic pipettes
- Syringes
- Digiblue movie creator or similar software

Safety note

Be careful not to include nut oils if involving children with nut related intolerance or allergies.

INTRODUCING THE ACTIVITY

Explain that, in industry, oil is often extracted from plants and seeds by boiling them in water after they have been crushed. Show the class a transparent plastic bottle with equal volumes of oil and water, explaining that it is similar to that produced from an industrial extraction. Ask them what will happen when you shake the container? Following the discussion, give each group their own bottle of oil and water to observe, shake, keep stationery, shake again, etc.

MAIN ACTIVITY

Once the children's observations have been discussed, and possibly drawn or photographed, the groups are challenged to create a 'separator' to collect both the oil and water separately.

Demonstrate that the oil can be poured off the top of the water but as the amount of oil reduces, it gets very difficult to complete the separation.

The focus of this activity is exploration, rather than planning, measuring, recording, etc. Each group is given the full selection of equipment, and given plenty of exploration time to try different methods. Possible methods include:

- Removing oil from the surface of the water with a pipette.
- Pouring the mixture into a funnel where the flow of liquid is controlled by either a finger or a blu-tac/plasticine stopper.
- Putting the mixture in a sauce bottle with a one-way valve.
- Putting the mixture into a syringe and gently emptying.
- Adding to a pump dispenser.
- Creating a unique piece of equipment.

Note: To prevent spillage of the oil and water working in shallow trays will help contain the liquids.

PLENARY

Each group demonstrates their preferred method to the rest of the class, and explain what makes it superior to the other methods they have tried. Each group could video-record their demonstration to play to the rest of the class.