Water Purification Experiment

How can you get clean water from contaminated water when you're an astronaut in space, or stranded on a desert island? Find out how to purify water using simple equipment you can find in the kitchen cupboard.

Watch the video here: https://bit.ly/3esfjxk
In this video, education coordinator (https://rsc.li/2EVZq4m) Catherine demonstrates how the water cycle can be used on a smaller scale to purify water. This simple activity can be set for learners to try at home with a responsible adult or used as a classroom experiment.

Equipment list

- One big container, and a small container that fits inside the large one
- Cold water
- Contaminant like food colouring and salt
- Cling film
- Something heavy like a pebble, or a ball of blu-tac

Health and safety

- If trying the water afterwards, make sure all your equipment is clean beforehand.
- If using any non-food contaminants, do not drink the water at the end of the experiment.

Activity instructions

1. Make your contaminated water by mixing in a contaminant like salt or food colouring into a small amount of water. Please note that the more water you use, the longer the experiment will take.
2. Assemble the experiment with the smaller container inside the larger one. Pour the contaminated water into the larger outer container.
3. Cover the whole experiment with cling film. If necessary, secure with tape or an elastic band.
4. Place the weight (a pebble or ball of blu-tac) in the centre of the cling film, so that it creates a low point directly above the smaller container in the middle.
5. Place the experiment in a sunny spot, and wait – you can observe the changes over time.

Explanation

The water cycle, consisting of evaporation, condensation and precipitation, is an important topic for learners, and this demonstration gives a great visual aid to understand what goes on in our atmosphere. It's also a good way to show reversible changes and how the dissolved contaminant can be separated from the mixture, and how a liquid can change state into a gas and then back to a liquid.

If you'd like to contextualise this experiment, here are some ideas:

- In space, astronauts need to clean their limited supply of water.
- You need to purify sea water after finding yourself stranded on a desert island.
- The school has asked about the differences between diet fizzy drinks and full-fat, so you could see what happens when you try to evaporate the liquids and what's left behind.

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