Activity Sheet

Make your own water filter

Year level

Year 5, Year 6

Theme

Wastewater

About this lesson

Students compete to make the most effective water filter and compare results.

Learning objectives

- Work in a team to build a water filter
- Discuss the importance of clean water
- Suggest improvements to the filter
- Understand the process of water filtration.

Curriculum links

Science

- Scientific knowledge is used to solve problems and inform personal and community decisions ACSHE083 ACSHE100
- Reflect on and suggest improvements to scientific investigations ACSIS091 ACSIS108

Resources

- Internet access
- Images of third world water collection, wells, dirty water etc. which can be found by searching:
  - Safe drinking water foundation
  - Unicef water
  - World Health Organisation Water
  - World Vision
  - WaterAid Australia

Items required for the experiment (per pair/group)

- Large plastic 2L bottles without a lid
- Knife or scissors
- 'Muddy water' made from soil and clean water
- 1 cup measure
- Timer
- Cotton wool, stones, small gravel, mulch, wood chips and paper towel or coffee filter.

Lesson description

Discuss

Due to its chemical properties, water is often considered the "universal solvent". It can mix with organic (natural) or synthetic (man-made) substances. Some of these products easily break down in water while others break down very slowly or, perhaps, never. Water naturally cleans itself with filtration through the ground and evaporation in the water cycle.

In the past, society disposed of its waste and garbage directly into lakes, streams and oceans. Now most countries require polluted water to be treated before it is allowed to enter into natural water formations (lakes, rivers, oceans, etc.).

- Ask the class to brainstorm ideas of what potable water is. Ask them what word they might confuse with potable.
- Show pictures of third world countries and where communities rely on water from wells and collect it from streams.
- Discuss the importance of clean water and places around the world that do not have access to fresh water.
- Explain to students they are going to compete in pairs or groups to make a simple water filter.

Activity

Make a water filter competition:

1. Cut off the bottom of a drink bottle and use to collect the filtered water.
2. Holding the bottle upside down, choose 4 filter materials and layer them from the neck in an order of your choice.
3. Hold the neck of the bottle over the container to catch the water. Slowly pour 1 cup of muddy water into the filter. Ensure there is some left over for comparison.
4. Time how long the filtration takes.
5. Compare the filtered water between groups. Whose water is the cleanest?
6. Continue to run the water through the filter and compare results.
7. Experiment with the filter materials and/or the order to try and improve the result.

WATER CORPORATION

It is best if cotton wool or filter paper is used in the neck of the bottle to stop the other filter materials from falling out. However you may want students to work this out for themselves.

Health advice: students will need to wash their hands after the activity and should not drink their 'filtered' water as it will not be to drinking water standards.

Reflect and summarise

Students vote on the top 3 filters as determined by the cleanest water produced. The winning groups share what materials and method they used.

- Discuss what improvements, if any, did groups make to their filter during the experiment.
- Get students to demonstrate their understanding of the importance of clean water.

Did you know?

Close to 700 million people throughout the world lack access to safe drinking water.

Key vocabulary

Absorbent: A material that can easily soak up liquid.

Bacteria: Unicellular microorganisms that do not have organelles or an organised nucleus. Some can cause disease.

Filter: A device with holes of varying size that removes substances from a mixture.

Particles: A tiny piece of something.

Potable: Any liquid suitable for drinking.

Protozoan: Any of a large ground of single-celled organisms.