KEMPTON STEAM MUSEUM

Clean Water for Life
Learning Resources

The Great Clean Water Mission!

Educator's Notes

KS1

Keywords

Clean water, rivers, filter, filtration

Topic Overview

Children will think about the importance of clean water. They will understand how dirty water can be made cleaner by using filtration. They will see a science experiment in action and become more aware of their own water usage.

Key Stage One Curriculum Links

Science

- **Uses of everyday materials** e.g. Pupils might work scientifically by: comparing the uses of everyday materials in and around the school with materials found in other places; observing closely, identifying and classifying the uses of different materials, and recording their observations.
- **Animals, including humans** e.g. find out about and describe the basic needs of animals, including humans, for survival (water, food and air).

Maths

- **Statistics** e.g. interpret and present data using bar charts, pictograms and tables.
- **Measurement** e.g. They become fluent in telling the time on analogue clocks and recording it.

Prior Learning

- Children will benefit from being familiar germs, and the presence of good and bad bacteria.

Presentation slides

Look out for the speech symbol throughout the presentation — it marks moments for discussion, questions and shared ideas.

1. **Title slide:** The Great Clean Water Mission!
2. **Meet Prescott:** Prescott is named after our No.6 Triple Expansion Steam Engine 'The Sir William Prescott'. Prescott features throughout our resources.
3. **A letter from London!:** Set the seen for the lesson, children are problem solvers in the task.
4. **Q1: Do we need water to survive:** Make this an active voting experience with trunks up for yes down for no.
5. **Answer...** Yes, all animals need water including humans. Discuss what else we need to survive like shelter and food.
6. **Q2: Is water a solid material?** Active voting with trunks up for yes down for no.
7. **Answer...** Water is a liquid, discuss – How could we turn water into a solid? and explain that we can turn water into a gas by heating it up. Introduce the term 'evaporation'.

The Great Clean Water Mission!

Educator's Notes – Continued

8. **Q3: Are all types of water safe to drink?** Final round of active voting.
9. **Answer...** Discuss how even water that looks clean or clear may not be safe to drink.
10. **Understanding the problem** Explain that drinking water with germs in can make us very unwell. Discuss ways that we use water at home. Some children may be able to think of how businesses use water too – swimming pools, garden centres, cafés etc.
11. **The museum is part of Kempton Park Pumping Station:** Since 1906, Kempton Park Pumping Station has supplied fresh water to London. Originally powered by steam, it now uses electric motors – a shift similar to moving from petrol to electric vehicles.

    The site remains essential for London's clean water supply. The Trust preserves historic equipment and buildings, showcasing British industrial heritage and safeguarding endangered engineering skills.

    Today, Thames Water PLC operates the site, which also houses the Kempton Great Engines Trust. The station filters water from the Queen Mary Reservoir, after extraction from the River Thames, then pumps it to Cricklewood's service reservoir.
12. **Cleaning water:** Encourage children to think of their own ideas for cleaning water.
    Describe that 'untreated' water has not been cleaned and is not safe to drink yet.
    The current process is first **settlement**, where dirt and debris sink to the bottom of the storage reservoir. Then the water goes through a rapid **gravity filter** using sand to remove larger solids, it's then treated with **ozone**, next it's the **slow sand filtration** process and is then finally treated with **chlorine** to kill remaining bacteria.
13. **At Kempton, water is cleaned using a Slow Sand Filter:** The top layer 'living ecosystem' layer is called the 'schmutzdecke'. It forms on the surface of the fine sand. This layer consists of 'good bacteria' (live microorganisms that are not harmful to humans), fungi, algae, and protozoa that decompose organic matter and trap pathogens. The water then passes very slowly through the layers of sand and gravel trapping dirt along the way.
14. **A filter experiment:** You may want to perform this experiment in the classroom as a 'teacher experiment' or simply follow the presentation slides. If experimenting in the classroom remind children not to drink any of the water, even after the filtration process. Bottles should be carefully cut in half beforehand and apply masking tape to edges if they are sharp. Other filter materials like pebbles or charcoal could be used. Cover the spouts of the bottles with lightly woven cotton or muslin cloth (secured with an elastic band) to allow water to pass through.
15. **Which filter is best?** Ask children to predict which filter will work best. Ask children why do we want the water to move through the filter slowly? Talk about how to make the experiment a fair test (same amount of water, same type of fabric to cover the spout).
16. **Experiment results:** Did they guess correctly? Encourage children to think about how they could improve the filtration process (pass the water through again, use different types of sand).
17. **My Water Diary:** This slide can be used to demonstrate how to complete the printable 'My Water Diary' (home/family task). The results printout can be used to help children to convert their water diary into a bar chart.