

Introduction

In this activity, students will compete individually or in groups to make the most effective filtration system for clarifying dirty water. While, this activity does not filter the water to reach drinking standards, it does help students explore the first stage of water treatment — filtration.

Objectives:

- Describe the process of water filtration before it gets to homes and taps.
- Describe methods and the importance of water conservation.
- Explore the effects of water pollution.

Key Questions:

- What does the water look like before and after filtration?
- Which filtration system made the clearest end water? Why?
- What was your group's strategy for your filtration system?
- What would happen if we filtered the water a second time?
- Does soil help filter our water?
- Is the filtered water clean enough to drink? What might still be in the water that filtration cannot remove?

Materials:

Per class:

- 5 pails with dirty water
- 5 clear plastic 2L pop bottles
- Gravel rocks

Any number of filtering items:

- sand
- rocks
- porous clay
- potting soil
- dirt
- clothing
- saw dust
- wood chips
- cotton balls
- silt
- alum
- coffee filters
- powdered charcoal

What To Do:

Preparation

1. Cut all pop bottles off 4 inches below the mouth.
2. Place the top of the bottle upside down in the bottom section of the bottle (like a funnel.)
3. Place a few gravel rocks at the bottom of the funnel to close the gap from the cap.

Set-up

1. At 5 separate tables, place 1 pail of dirty water, one cut and prepared pop bottle with gravel, and equal amounts of all available filtering items.
2. Divide the class into 5 groups corresponding to the 5 separate tables.

Challenge

1. As a group, come up with a filtering system to turn the dirty water in the pail into the clearest sample.
2. Use the pop bottle funnel as your basic structure and use any of the items on the table as filtering devices.
3. You can use more than one, but you get only one chance at filtering the water.
4. Once all groups have completed their filtering system, watch one group at a time test how effective their system is for clarifying the water.

Bonus Challenge: Limit the number of materials you provide for the water filtration challenge and see how creative your students can be with their designs.

Extensions:

- Is the filtered water clean? What might still be in the water that filtration cannot remove? As a group, brainstorm reasons why streams and rivers may not always have clear water.
- After trying once to make an effective filter, use your gained knowledge from the experience to make a better filter. Test it out, if possible.
- Demonstrate the limits of filtration by adding food colouring to the water. Predict and discuss why food colouring can or can't be filtered out.

Thank you to [Science World at the Telus World of Science](#) for inspiring this assignment