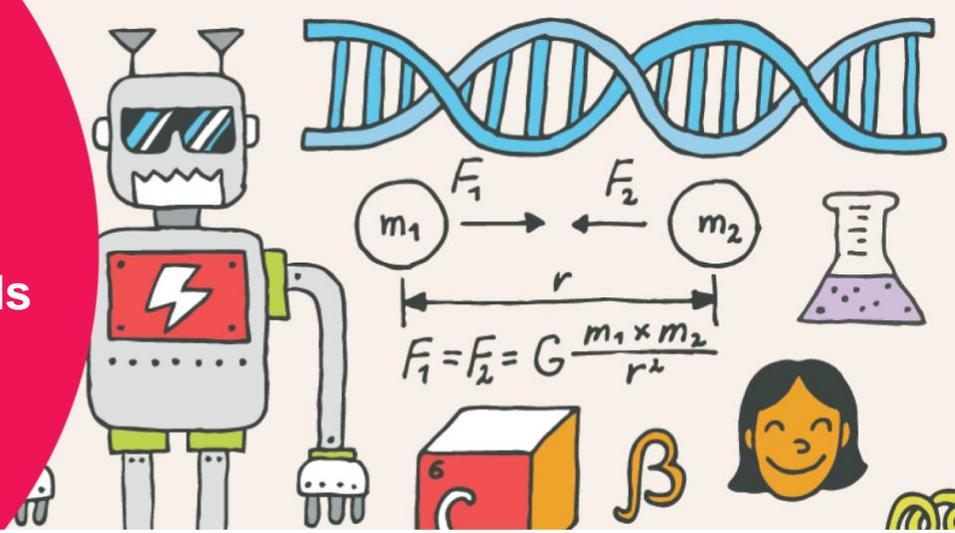


Water World

Activities to engage minds before and after your museum visit



BEFORE YOUR VISIT

Activity 1: Water and the World

Learning objective

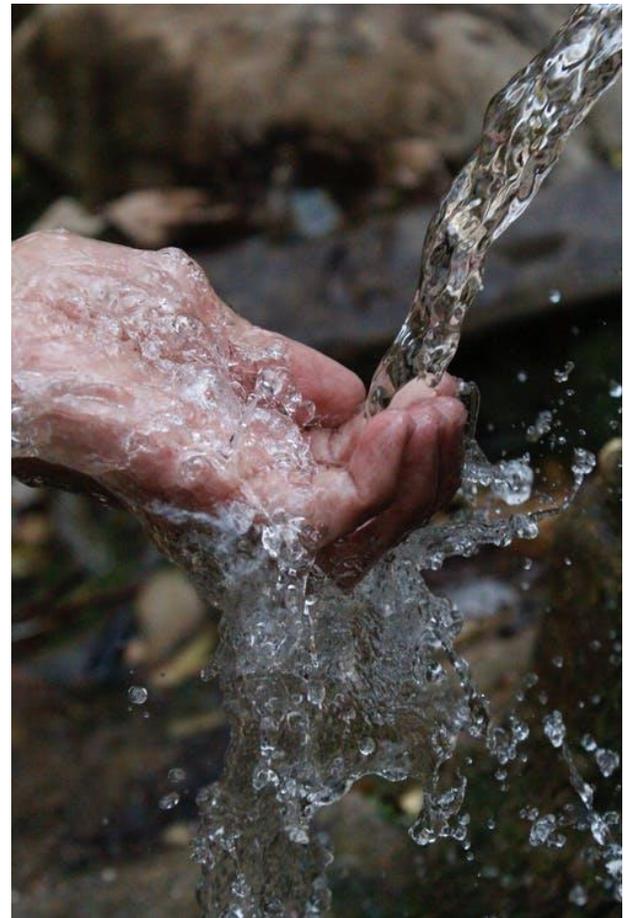
Through a demonstration of the global water supply, students will begin to consider their relationship to water systems.

Materials

- One empty 1 L pop bottle
- Blue food colouring
- Eyedropper
- Graduated cylinder
- A small container

Instructions

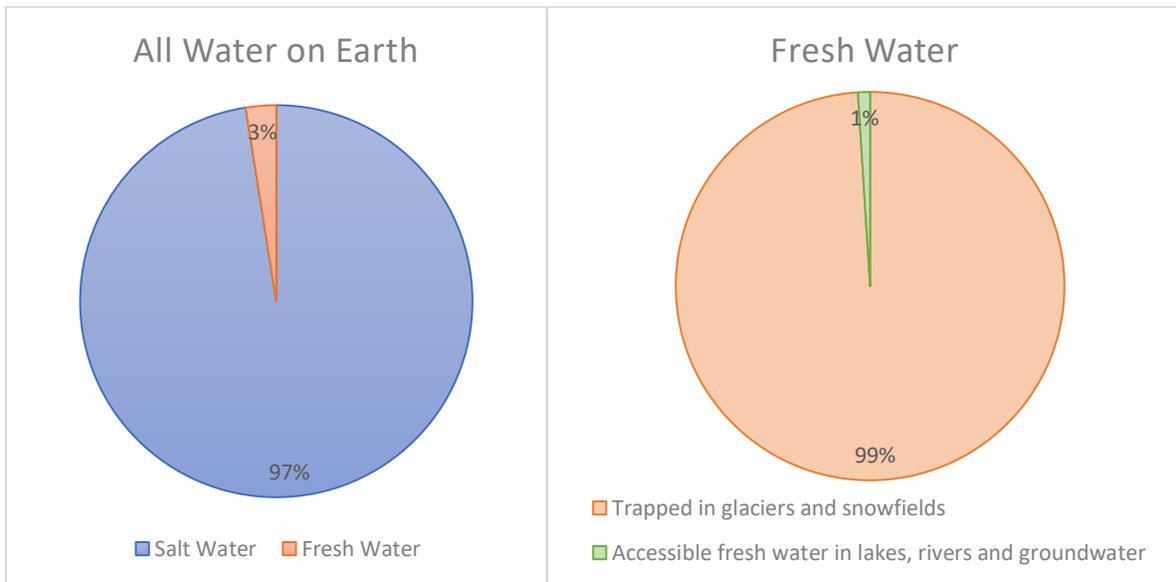
1. Fill the 1 L soda bottle with tap water and add enough blue food colouring to make it a rich shade of blue.
2. This bottle of water represents all of the water on the planet. Pour 3 mL from the bottle into a graduated cylinder. The amount left in the soda bottle represents water from the ocean (salt water).
3. The amount in the cylinder represents all of the freshwater on the planet. Pour 0.5 mL from the cylinder into another container. The amount left in the



This activity package was produced in collaboration with University of Ottawa Faculty of Education students Kerkeslin Keillor, Conlan Ladreniere, Kayla McIntee, and Ryan Schreider.

cylinder represents the amount of water in frozen icecaps and glaciers. The amount poured off represents liquid freshwater found in ponds, lakes, rivers, and groundwater.

Discussion



- What happens if the small amount of water that we do have available to us becomes polluted?
- Can we get water from other sources? (Removing salt from ocean water, a process called desalination, is very costly.)
- What might be some potential consequences of using too much water?

Activity 2: Water Usage Log

In Canada, we all use water daily, and it is a luxury that we rarely even consider. In this activity, you will be challenged to monitor your household water usage and consider your part in Canada's water systems.

Learning objective

Students will investigate how they use water daily, and reflect on their choices regarding water use. This will be done over three days of logging household water usage.

Materials

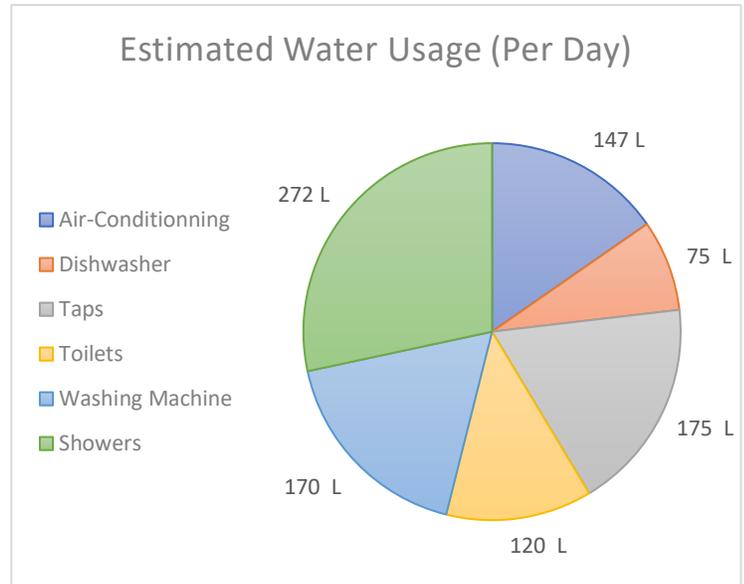
- Personal Water Usage Log

Procedure

1. Use the Personal Water Usage Log on page 4 to track water usage.
2. Monitor your household usage of water for one day.
3. Repeat for three days (one being on the weekend).

Discussion

- On average, how much water do you use daily?
- Considering how much freshwater is available to humankind, do you think it is important that we monitor and limit our water usage?
- Are there ways you can reduce your water usage?
- Discuss how dependant we are on water.
- What do you think would happen if Canada (one of the biggest sources of freshwater) decided to create laws to restrict water usage?



Name: _____

Personal Water Usage Log

Activity	Estimated volume in litres	Times/Day 1	Times/Day 2	Times/Day 3	Total in litres for 3 days	Estimated total for 7 days*	Estimated total for 30 days*	Estimated total for 365 days*
Washing hands for 2 minutes	3.5							
Brushing teeth (tap off during brushing)	8							
Taking a shower (standard shower head) – 10 minutes	190							
Taking a shower (low-flow shower head) – 10 minutes	95							
Taking a bath (full tub)	150							
Flushing the toilet (standard flow toilet)	5							
Flushing the toilet (low-flow toilet)	4							
Drinking tap water, or beverage prepared with water	3							
Cooking a meal	10							
Washing dishes by hand	40							
Running the dishwasher	60							
General household cleaning	10							
Washing one load of laundry	115							
Watering lawn or plants/ running a sprinkler	1100							
Washing a car	190							
Other (specify) _____								

* **Hint:** Determine the average litres per day and multiply by the number of days.

Activity 3: The Power of Water

Water is not only a valuable renewable resource; its raw power can also be harnessed and used as an energy supply.

Learning objective

Students will discover the power of water, how it can be used to create energy, and how valuable it can be as a renewable resource.

Procedure and discussion

1. Use online resources to discover how hydroelectric dams harness energy from water.
2. Use online resources to find out where Canada ranks among the leading hydroelectric producers. Do you think we are doing enough in using hydroelectric energy to power our cities?
3. Why are renewable resources so important for humankind?



AFTER YOUR VISIT

Activity 4: Pollution

Learning objective

Students will explore how pollutants find their way into the water table. They will also discover the impact human pollutants have on the water table.

Materials

- A clear, waterproof container
- Sand
- Small pebbles/aquarium rocks
- Dyed sugar, or any powder with food colouring

Instructions: Part 1

1. Using the small pebbles as a foundation, create an aquifer model in your container: Stack the pebbles high at one end, then slope them down to form a “lake” at the other.
2. Layer some sand over the whole container, to simulate soil.
3. Sprinkle some dyed sugar atop the hill of sand (not in the “lake”) to simulate human pollutants, such as fertilizers.
4. Get the class to write down their expectations for what will happen after rainfall.
5. Begin to sprinkle water over the pollutants, simulating rainfall.
6. The water will begin to dissolve the coloured sugar, taking it down through the soil into the groundwater.
7. Have the students describe how the pollutants reacted to the simulated rain water, and how this affects the water.
8. Continue sprinkling water until about half a cup of water has been added. Wait about two minutes to see the “lake” change colour.

Instructions: Part 2

9. Reset the experiment using steps 1-3 (above). This time, ensure the sand layer at the high end is thicker.
10. Create a small divot in the sand, and fill it with dyed sugar.
11. Cover the dyed sugar with sand and pat it down; this will represent an old landfill.
12. Get the class to write down their expectations for what will happen after rainfall.
13. Begin to sprinkle water over the pollutants, simulating rainfall. Water the model with about half a cup.
14. It takes time for the water to dissolve the pollutants in the “landfill,” but eventually the colour change will be apparent in the lake and groundwater.
15. Students will need to lift up the container and look underneath to see the colour change.

Discussion

- How did the pollution enter the water table?
- In the future, what can humans do to improve our conservation efforts?
- Was there a difference between the two simulations? Why?

Activity 5: Conservation

Learning objective

Students will reflect on how their views about water systems and human conservation activities have evolved through the museum visit and supporting activities.

Discussion

- After your visit to the museum, discuss ways of conserving such a valuable renewable resource.
- Has the visit to the museum — or any of the activities before or after the visit — affected your opinion about water systems and their importance to all life?
 - If so, what display, activity, or discussion had the most significant impact on your opinion?
 - If not, what is the basis for your existing opinion?