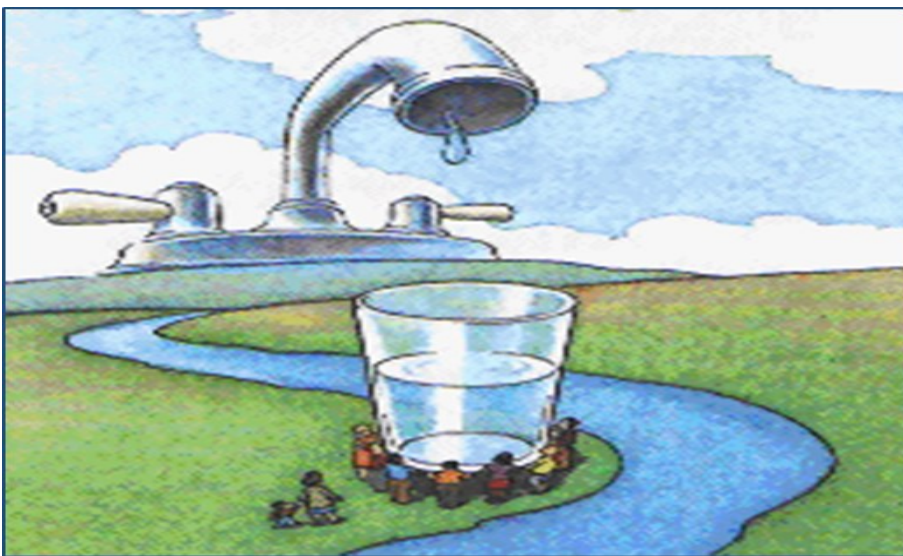


All the Water in the World

Understanding Water Sources & Conservation
Post Water Festival or Independent Lesson



Description of Lesson

Students will gain awareness about the ways water is used in the Canadian economy. They will learn about the amount of water Canadians consume and how this is divided within the home. Students will compare their family's and community's water use to averages by calculating the water use of their families and using the data from the class to analyze the water needs of their town.

Connect with the Georgian Bay Biosphere

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Georgian Bay Biosphere: Lesson in a Backpack Program

At a Glance

Grade Level: 5

Learning Environment:
Classroom

Prep Time: 15 minutes

Length of Lesson: 1 hour

Key Vocabulary: Conservation, water footprint, efficient, inefficient, consumption

Staffing: 1 educator

Materials:

Student worksheet
Graph paper
Pictionary Cards
White board and markers or blackboard and chalk

Kit available at the NNDSB Resource centre.

Groupings: Whole class, and Individual work, groups of 3-4

Teaching/Learning Strategies:
Presentation, discussion, individual problem solving.

Lesson Outline

TIME	ACTIVITY	LOCATION	MATERIALS
30 minutes	Calculate Your Water Footprint	Classroom	Worksheets
30 minutes	Water Conservation Pictionary	Classroom	Pictionary Cards

Curriculum Expectations

Science and Technology

Understanding Earth and Space Systems: Conservation of Energy and Resources

Overall Expectations

1. Analyze the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources

Specific Expectations

1.1 analyze the long term impacts on society and the environment of human uses of energy and natural resources, and suggest ways to reduce these impacts

Mathematics

Data Management and Probability

Overall Expectations

Collect and organize discrete or continuous primary data and secondary data and display the data using charts and graphs, including broken-line graphs

Specific Expectations

Collect and organize discrete or continuous primary data and secondary data and display the data in charts, tables, and graphs (including broken-line graphs) that have appropriate titles, labels (e.g., appropriate units marked on the axes), and scales that suit the range and distribution of the data

Background

How Much Water Do We Use?

Protecting water is very important. We need fresh water for a variety of purposes. For one thing, water is necessary for the economy. In Canada, the largest amount of fresh water uses is by agriculture, at 66%, followed by electricity generation at 12 percent. Roughly 10 percent of the fresh water we consume is used by manufacturing and industry; 8 percent by residences and businesses in cities, towns and rural areas, with the remaining 4 percent being used by mining and petroleum industries. Growth of cities and industry, and changes in our climate mean that there is more and more pressure on our ability to supply enough water to households. This is why having enough water is a growing concern for many communities. Without a reliable supply of clean, fresh water, plant, animal and human life, could not continue.

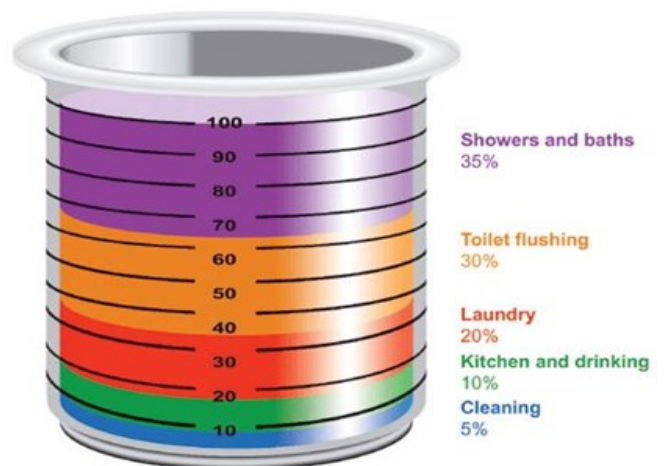
Canada contains 7 percent of all the fresh water in the world. But thinking that we have more than enough water leads people to abuse and waste it: from polluting our waterbodies with sewage, to washing water down the drain with inefficient appliances. While human survival requires a minimum of 5 litres of water a day, in 2012, the average Canadian daily domestic water use per person was 326 litres. This is double the amount used per capita in France and Germany.



Water Conservation – Every Drop Counts

We can help solve the problem of our high water consumption by better managing the way we use water and reducing the amount of water we waste. The answer is water conservation. Water conservation means cutting back on our water use where we can, and using water more efficiently to do the same tasks with less water. This will help us to protect water for present and future generations. Wise water use will also lower pollution levels and health risks, to humans and wildlife, and save money. Making small changes to our equipment and to how we use water can help us reduce the amount we use in homes and businesses by more than 40 percent! We can begin by identifying where we use water in our homes. Then we can decide on how to reduce on the water we use by cutting out our wasteful habits or installing more efficient fixtures and water equipment.

Water use in the home



How domestic water use is divided in Canada (Environment Canada, 2013)

How Can We Save Water?

Where is our water going? Showers and baths account for 35% of our water use, while flushing the toilet accounts for 30 percent. We use 20% of water consumed for laundry, 10% in the kitchen and for drinking water, and 5% for cleaning.

1. Take a quick shower instead of a bath – you'll save over 37 liters of water
2. Fill the tub half full if you take a bath
3. Save 7.5 liters by turning the water off while brushing your teeth or washing your hands
4. Fix leaky faucets and toilets. More than 25 L per day, or 10 000 L per year, of water is wasted by a tap that leaks one drop per second. A leaky toilet could fill up a large swimming pool with the amount of water it wastes in a year (up to 200 000 L)
5. Wait to run appliances like the dishwasher and washing machine until they are full. Also, try rinsing dishes less before you put them in the dishwasher, and see if they get just as clean (they probably will).
6. Install water saving fixtures like low-flow shower heads and low volume toilets



The Parry Sound area is known as the 30,000 Islands, but could also be known as the 30,000 wetlands!

There are countless wetlands of all shapes and sizes throughout the region.

Part A. Calculate Your Water Footprint

Ask students if they know where their water comes from (municipal water, water from a well).

Have students brainstorm how water is used in the Canadian economy (e.g. agriculture, electricity production, industries, use by homes and businesses, mining and oil and gas industries).

Ask students to brainstorm ways that they use water at home and at school every day. Have them estimate how much water they might use during one day and compare their guesses with the average Canadian per capita daily water use of 326 litres.

Teaching and Learning

Compare this with the minimum amount of water required to maintain life: 5 litres a day. Ask students if they think Canadians use too much water. Why or why not?

Introduce the idea of measuring our water consumption, or 'water footprint' and hand out the Water Wise Student Worksheet. Explain to students that they will be calculating the water footprint of their family and then their community.

Have students complete Section I of the worksheet on their own. Then work together as a class to complete Section II. Have a class discussion about how to conserve water using the post activity discussion questions provided.

Part B. Water Conservation Pictionary

Divide the class into teams of 3 – 4 students, and ask them to give themselves a water conservation themed names (e.g. Every Drop Counts, Water Savers).

Have one student from each team select a card from the Water Conservation Pictionary Deck. Cards will contain a water saving or a water wasting activity. Cardholders will take turns drawing the activity on the whiteboard or blackboard, for their team to guess.

Teams will have one minute to guess what the picture means. If they are unable to guess, other teams can steal the point if they can guess the correct answer.

After each team has had a chance to play one round, have a different student from each team select a card and play another round. Continue playing until desired time has passed or cards are used up.

Vocabulary

Consumption – When we talk about water consumption, we mean the water that we use and don't return to its source.

Efficient – to prevent the wasteful use of a resource.

Inefficient – to be wasteful of resources.

Water conservation - reducing our water use. It also means protecting water from things like pollution. The reason we conserve water is so that we will have enough to meet our needs, the needs of the natural environment, and the needs of future generations.

Water footprint - the amount of water a person uses in one day at home, school, or work. It includes the water you use directly (e.g., from a tap). It also includes the water that produces your food, consumer goods, and the energy you use. This hidden water makes up the majority of someone's water footprint

Section II:

1. Work as a class to determine the average amount of water used per person within the households represented by the class. To do this, add the gallons per person per day results found for question 3 in the data table above for each student, then divide by the total number of students. Show all work below:

2. Determine the daily use for the community by multiplying the answer found in question 1 above by the number of people living in your town (Parry Sound population: 6500). Show all work below.

Post Activity discussion questions for class:

a. How is water supplied in your community and what are some factors that could influence water availability?

b. What are some water-saving measures individuals and the community can follow to reduce water needs?

c. Why is it important to reduce our water use, and use water wisely?

d. What if there was a drought where you live or the water was turned off for some other reason—a chemical spill, for example—what would you do? How do we take water for granted? Do you think water will always be available? Why or why not?

Part B. Water Conservation Pictionary

Brush your teeth with the taps turned off	Leave the water running while brushing your teeth
Taking a short shower	Taking a bath in a full tub
Fixing a leaky tap	Letting a tap drip
Washing your hands with the taps turned off	Leaving the water running while washing your hands
Using a water saving shower head	Fixing a leaky toilet
Watering the lawn after the sun sets	Washing one item in the laundry
Washing the dishes in a sink of water	Washing the dishes under running water