Lessons in a Backpack

United Nations Educational, Scientific and Cultural Organization

GEORGIAN BAY BIOSPHERE MNIDOO GAMII Spirit of the Water

Our Environmental Footprint
Water Consumption

Description of Lesson

We use water to grow our food, support industry, and of course, to drink. Water comes from the natural environment and provides food, transport routes, recreation, and other services. Keeping water ecosystems healthy ensures these vital services are maintained. This lesson will have students look critically at the way that they use water everyday.

Connect with the Georgian Bay Biosphere

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GEORGIAN BAY BIOSPHERE MNIDOO GAMII Spirit of the Water

At a Glance

Grade Level: 1 and 2

Learning Environment: Indoor Classroom and washroom

Prep Time: 15 minutes

Length of Lesson: 1 hour

Key Vocabulary: Fresh water, salt water, treatment plant, conservation

Staffing: 1 educator

Materials:
"Water Footprint Video" OR "World Water Day Video"
Dewy's Adventure Cards and Story
Pictures of "things that shouldn't go down the drain".
19 liter pail, salt, measuring cup, peanut butter jar, 2 teaspoons.
Six 2-liter pop bottles, two 1-liter pop bottles, Invisible water use card
Water conservation cards in envelope, bucket from previous activity, food coloring
Environmental Footprint Tree and/or chart paper and marker

All materials are available from GBB. To get this resource, call (705) 774-0978.

Groupings: Whole class, and Small groups

Teaching/Learning Strategies: Hands-on learning, demonstration, inquiry

Lesson Outline

TIME	ACTIVITY	LOCATION	MATERIALS
10 min.	**A. Water Video**	Classroom	”Water Footprint Video” OR “World Water Day Video”
15 min.	**B. Dewy’s Adventure Game**	Classroom	Dewy’s Adventure Cards, Dewy’s Adventure Story Pictures of “things that shouldn’t go down the drain”.
10 min.	**C. The World in a Bucket**	Classroom	19 liter pail, salt, measuring cup, peanut butter jar, 2 teaspoons.
10 min.	**D. Invisible Water Use**	Classroom	Six 2-liter pop bottles, two 1-liter pop bottles, Invisible water use info. card
10 min.	**E. What can WE do; secrets**	Washroom	Water conservation cards in envelope, bucket from previous activity, food coloring
5 min.	**F. Count yourself in!**	Classroom	Environmental Footprint Tree and/or chart paper and marker

Curriculum Expectations
Grade 1 and 2 Science and Technology

Grade 1: Understanding Life Systems-Needs and Characteristics of Living Things

Overall Expectations

1. Assess the role of humans in maintaining a healthy environment
2. Investigate needs and characteristics of plants, including humans
3. Demonstrate an understanding of the basic needs and characteristics of plants and animals

Specific Expectations

1.1 Identify personal action that they themselves can take to help maintain a healthy environment for living things, including humans.

2.2 Investigate and compare the basic needs of humans and other living things methods

Grade 2: Understanding Life Systems-Growth and Changes in Animals

Overall Expectations

1. Assess ways in which animals have an impact on society and the environment, and ways in which humans have an impact on animals and the places where they live.

Specific Expectations

1.2 Identify positive and negative impacts that different kinds of human activity have on animals and where they live.

Background

Water is life. We use water to grow our food, support industry, and of course, to drink. Water comes from the natural environment (where else?) and provides food (like fish!), transport routes, recreation, and other services. Keeping water ecosystems healthy ensures these vital services are maintained.

We all know that water is essential, but too many Canadians think it is unlimited. This perception has led to misuse and abuse of the resource: We use more water per capita than any other country except the USA (in 2012, the average Canadian daily domestic use of fresh water per capita was 326 litres, double the per capita usage of France and Germany!).

Why do we need to conserve water, considering we live beside the Great Lakes!?Conserving water will extend the life of the existing supply. While it's true that water is constantly being recycled through the Earth's water cycle, people are using up our planet's fresh water faster than it can be replenished. While water is re-circulated and falls as rain, much of it falls in areas where it can't be harvested for use for a very long time. As demands for water grow, so too does the risk of contamination. Pollution of surface and ground water reduces the supply of available, clean, salt-free water. Our water use almost always leads to some degree of deterioration in water quality, so the less water we draw the less we upset the aquatic ecosystem, and the less we have to spend to restore the water quality to an acceptable standard for public use.

Conserving water will extend the life of the waste water treatment facilities and save municipal money. (Financing by municipal governments for the treatment of water supplies and wastewater is becoming increasingly constrained.) Conserving water (for activities such as washing dishes and clothes) will save you money on your energy bills.

Only 1% of the water on Earth is fresh and usable for humans. Canadians have 7% of this fresh water. We are fortunate to have a significant amount of this valuable resource, but it also means that we are responsible for keeping it clean and allowing it to last.

In Canada, 84% of the population lives in a narrow southern band, while 60% of our water supply flows north to the Arctic Circle. Pressures on the water in this narrow southern band are growing due to population growth and increased water usage per person.

It is becoming more important to protect water, yet we are getting worse and worse at it! For example, between 1972 and 1996, Canada's rate of water withdrawals increased by almost 90% while our population only increased by 33%, illustrating the growth in our thirsty lifestyles. We could get along without using so much before, why not now?

At least one of the causes of our water problems is easy to manage—the way we waste water! In this lesson students will learn why it is important to conserve water (do the same with less) and protect water (keep it clean), and how to do it in their everyday lives.

Making a Cultural Connection

Traditionally, Aboriginal peoples believe that all things have a spirit. This includes rocks, water and soil. Water is considered to be sacred. It is life—it is a part of birth, and it sustains life afterwards.

Watch the video ”The Sacred Relationship” at the following link: www.youtube.com/watch?time_continue=428&v=5NxBzyZ-8a4. This video is geared to an older audience and is close to an hour long. Consider watching this to increase your own understanding. Share your knowledge.

Watch the video “Tea of Life” at the following link: www.youtube.com/watch?time_continue=44&v=Nu2D1akq318. This video is less than four minutes long. In this video, Dene Artist Roy Salopree collects water from a special water hole and makes it into tea to be used as medicine. After viewing, discuss with your students. What stood out to them from the video? How did it make them feel?

Discussion Point

Many First Nations do not have access to water, have lost their access to water, or are at risk of losing their access to water. Not only do we all need water to live, but water also holds a sacred cultural meaning for these communities. Ask your students how their lives would be changed if suddenly their taps did not turn on, or their lakes were suddenly dried up or unsafe to swim in or drink from.

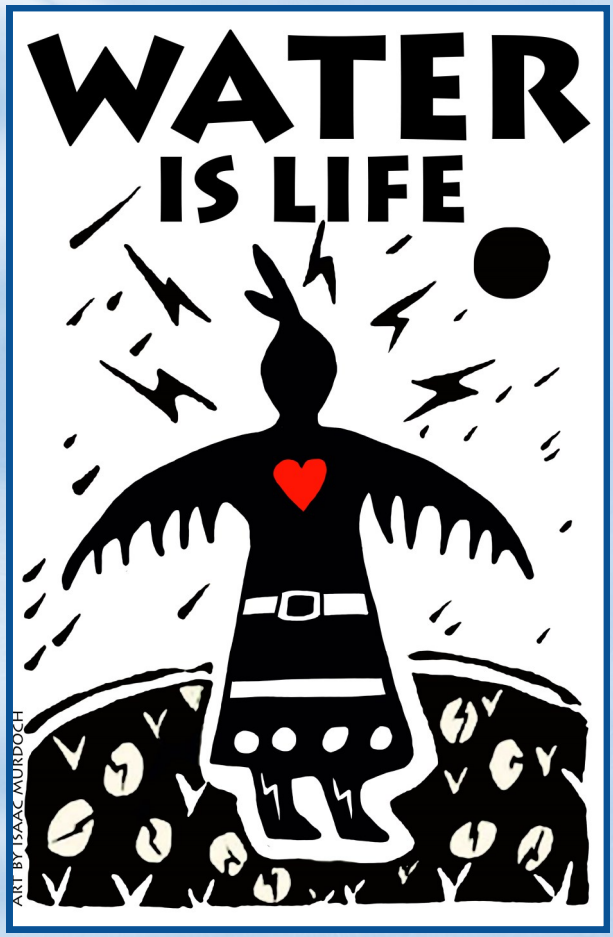
Unfortunately this is a reality for many Canadians and First Nations Peoples.

More information and stories can be found at

www.wcel.org/program/sharing-stories/water

Lesson and information originally from www.sacredrelationship.ca/teach-about-water/.

Photo from: www.wcel.org/program/sharing-stories/water



Teaching and Learning

Part A. Water Video

Tell the class that today they'll be learning all about water. If you are teaching this lesson as part of the "environmental footprint" set of lessons, then play the Water Footprint Video. If you are teaching this lesson by itself, then play the World Water Day Video.

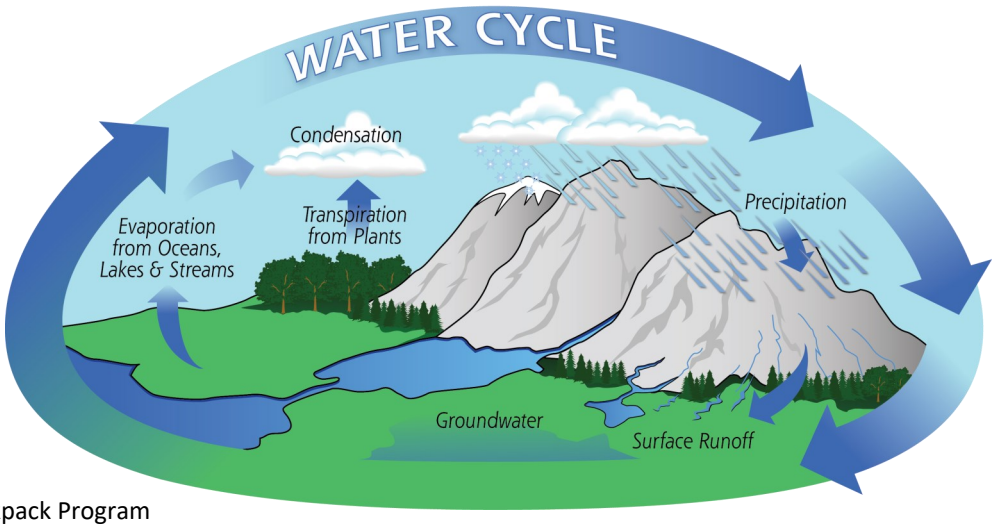
Part B. Dewy's Adventure Game
There are certain things that should never be put down the drain.

Discuss with the class that all water on Earth is part of the water cycle. This means that water goes through a great journey…it can be found in many places (ex. in the sky, in a lake, in the body of plants and animals, underground) and in many different forms (ex. ice, snow and clouds are all made up of water!). To demonstrate the many different places and forms of water in the water cycle, play the "Dewy's Adventure" game.

Dewy's Adventure Game: Each student should be handed a card with a picture/word on the front and a sentence on the back. The game will start when you read Dewy's Adventure Story to the class. If students think that the word on the front of their card describes the correct next step in Dewy's adventure, students will raise their hand and read what is on their card. They will then flip over their card and read the sentence on the back, explaining where Dewy will go next. This will cue the next student to raise his/her hand.

After the game, discuss that water on Earth stays in the water cycle forever, and there is a limited amount of it. Start by asking, "If Dewy were a real drop of water, how old do you think he'd be?" Have a glass of water on the table next to you. Ask, "Can you guess how old this water is?"

- Dewy would be as old as time! Water moves endlessly through the water cycle, with no beginning and no end. There is the exact same amount of water on Earth today as there was when dinosaurs roamed the Earth!
- The water in the glass may have fallen from the sky as rain just last week, but the water itself has been around pretty much as long as the Earth has! We drink the same water that dinosaurs drank! We all have water in us that may once have been part of saber tooth tigers, and ancient oceans. When kings and princesses, knights and squires took a drink from their wells, this glass of water might have been part of those wells.
- And in time to come, the water we drink and pee will become the water that people in the future will depend on. That is why it is so important to keep our water clean.



- Luckily, water in the water cycle is always being filtered and cleaned by Mother Nature's processes. But, sometimes humans are careless and put harmful substances into the water system that can't be cleaned by nature. These harmful substances could end up staying in the water cycle forever. Unless scientists or nature can figure out a way to filter it, what we put into water stays in the water cycle- even things that are not meant to be there (like chemicals to clean your toilet).

Explain to students that some things we use at home are fine to go down the drain, and some things aren't. It is important to know the difference so that we can keep our water clean. Always have your parents read labels for you, before you throw something down the drain. Show pictures of "things that shouldn't go down the drain". There are hazardous waste handlers that are available to properly dispose of certain substances.

Part C. The World in a Bucket

This activity is meant to show that there is not a lot of fresh water available to humans on Earth. Canadians are lucky to have the amount that we do!

To introduce the activity, discuss that there is A LOT of water on Earth. More than half of the Earth's surface is water. So why do we need to conserve it?

Fill the 19 liter bucket with water, and place it in clear view for all the students to see. Explain that this represents ALL of the water on Earth.

Get a student helper to take out 500 ml of water from the bucket with the measuring cup and pour it into the transparent peanut butter jar. This represents all the freshwater in the world (3% of all Earth's water). The water remaining in the bucket is saltwater.

Explain: Most of the water on the earth is salt water, like all the water in the oceans. If you have ever tried to gargle with salt water, you know that people cannot drink it. Humans prefer fresh water because we can drink it, cook with it, clean with it, and grow our food with it.

Have a student helper pour 375 ml from the peanut butter jar back into the measuring cup. This represents the water that is frozen in the polar ice caps and glaciers. The remaining 125 ml represents all of the accessible fresh water on the Earth.

Have a student helper take out 1 ml of water from the peanut butter jar with the teaspoon. This represents all the water in the Earth's fresh water lakes (including our own Georgian Bay and the small lakes that we see around Parry Sound!) The water remaining in the bowl is groundwater found beneath the Earth's surface.

Have a student helper take ½ a drop of water from the 1 ml. This represents all the freshwater in streams and rivers.

Discuss with the students their reaction to this demonstration. Ask the students if they feel that water is a valuable resource. Can any life survive without clean, salt-free water? We are lucky to live in Canada! Does everybody have enough water?

Part D. What can we do?! Secrets unleashed...

Have the class brainstorm ways to save water. Ask them to either come up with an idea to share with the class, or pick an idea from the water conservation cards in the envelope provided.

Tell the class that they'll be learning some more ways to conserve water at home. Bring them to a large washroom to show these secrets.

a) Test for leaks in a school toilet by placing a drop of food colouring in the toilet tank. If the colour shows up in the bowl without flushing… you have a leak!

b) Practice flushing the toilet by pouring the bucket of water (used for the "World in a Bucket" activity) into the toilet bowl. Tell the students that we can flush our toilets this way using leftover shower or bath water, or rainwater.

Lifehacker.com

Part E. Water Wrap Up: Count Yourself In

Have students come up with a list of 5 ways they can save water at home or school. Write the list on chart paper and hang it in the classroom.

If your class is participating in the "environmental footprint tree" activity, then have students record

Extension Activities

Some of the following ideas were inspired by “Connecting with Nature: An educational guide for grades four to six”, by the David Suzuki Foundation. Check it out for more sustainability-related, outdoor-based lesson ideas.

Outdoor Opportunity

Go for a walk around your community to find sources of water (puddles, sewers, rain barrels, rivers, sprinklers). Discuss how water is being used. What sources could the students drink? Is any being wasted? Are any creatures depending on the water? Where does the water go? How could some of the water be conserved?

Optional Follow-Up Activities

Have students write a song about the importance of conserving water, using the tune of a familiar childhood song. Visit davidsuzuki.org/youthandnature for examples of songs.

Have students sing their songs over the school PA system.

Place a rain barrel in the schoolyard. At the end of the week, go outside and look at the water the barrel has collected. Use the collected water to water plants around the schoolyard.

Locate the school’s water meter. Track the water use of the school for one week. Launch a water conservation campaign by sharing your commercials at a school assembly or creating posters on water conservation.

Do a month long home or school water use study. Set a goal to decrease water use each week through new water conservation habits.

Field Trip Ideas

Visit the Water Treatment Plant in Parry Sound. Contact 705-746-5641 to arrange a field trip.

Visit the Waste Water Treatment Plant in Parry Sound, by contacting 705-746-5261. It is recommended for the teacher to visit the plant first (before taking a class) to make sure it would be appropriate for that group.

Additional Resources

Have students visit http://kids.nationalgeographic.com/kids/games/puzzlesquizzes/water-wiz/ to play a game related to water conservation.

Dewy's Adventure Story

Dewy's Adventure through the Water Cycle

Dewy Dropper was a drop of water. For as long as Dewy could remember, ever since he was just a little droplet, his home had been Georgian Bay. Dewy was a curious and adventurous little drop, and for that reason he had explored every single part of his home, from the sandy beaches to the rocky islands. He explored the hot, sunny surface and the deep, cold bottom.

Growing up, Dewy was always a happy drop of water, but recently he became sad. When his good friend Sandy the seagull asked him why he was so sad, he simply replied "Well, Sandy, I love my home, Georgian Bay, but I want to see more. Most of my friends and family have gone on great adventures, but I have never even left my home of Georgian Bay." Sandy smiled and said "I know exactly what you should do."

On a really warm day, Dewy followed Sandy to some very shallow water. At around lunchtime, Dewy started to get hotter and hotter, and at the same time he started to feel lighter and lighter. And that's where his adventure began.

Let's help Dewy through his great adventure. Somebody has a card that can explain what happened to Dewy first. It should answer the question, what did Dewy turn into?

TEACHER INFORMATION

The order of cards read in the "Dewy's Adventure" game should be as follows:

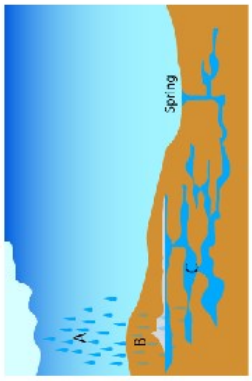
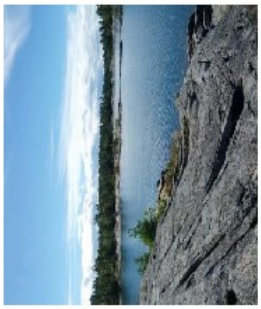
Steam □ cloud □ rain drop □ sidewalk□ pipe □water treatment plant□ tap□ belly □ toilet □septic tank□ river□ waterfall□ ocean □ iceberg□ underground □ blueberry plant□ a black bear □ rock □ Georgian Bay!

(The student with the card reading *steam* on the front should begin.)

Dewy's Adventure Cards - Front

STEAM 	CLOUD 	RAIN DROP 	SIDEWALK 
PIPE 	TAP 	BELLY 	TOILET 
SEWER 	RIVER 	WATERFALL 	OCEAN 

Dewy's Adventure Cards - Front

A BLACK BEAR 			
BLUEBERRY PLANT 	WATER TREATMENT PLANT 		
UNDERGROUND 	ROCK 		
ICEBERG 	GEORGIAN BAY! 		

Dewy floats higher into the sky and turns into a…	Then Dewy feels heavy and dark. He hears thunder and turns into a…	Then Dewy sees people walking past him. He has landed on a…	Then Dewy rolls towards a metal grate and ends up in a round tube. He has fallen into a…
Dewy follows the pipe until he gets to a building where he is cleaned. He is at the…	Then Dewy follows along in pipes until he falls down into a cup of water. He has just come out of a…	Then Dewy slides into someone's mouth, down their throat and into their…	Then he feels himself going down, down, down until he falls out into a…
Once again Dewy slides in pipes until he reaches a big, stinky…	Then Dewy gets cleaned and lands outside under the sun! He feels like he is on a slide. He is really flowing along on a…	He floats along until he hears a roaring sound ahead of him. Soon, he feels like he is falling. He has falling over a…	He lands in a great big lake and he can see water in all directions. It is salty here. He has landed in the…

He drifts in the ocean getting colder and colder until one day he gets too cold. Dewy starts to freeze! He turns into an…	He stays frozen in ice for a long time, until he finally melts. He starts sinking down, down, down into the dirt. Now he is...	He stays in an underwater pool until he feels himself being pulled up, out of the ground. He is in something green. He has been sucked into a…	Soon enough, Dewy feels that someone is eating the plant he is living in! Who is eating Dewy's new home?
Dewy lives in the bear for some time. But the bear has been drinking a lot of water and he has to go to the bathroom. He gets peed out and lands on a…	Far away, he sees his friend Sandy the Seagull. He trickles down the rock and into his home…		