Access to Clean Water

Teaching Guide

Grade 2

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Access to Clean Water

Unit Overview

Grade 2 students will learn the value of water by exploring what water usage looks like in their daily lives and how their access compares to students of a similar age in a Northern community. Students will foster empathy for individuals living with limited access to clean water. They will develop scientific knowledge about water and identify the real world problems that surround accessing clean water. Students will use scientific skills and innovative thinking to address the issue of water contamination by creating a water filtration system.

Rationale

Water is the most important resource on this planet. Individuals use it to clean, cook, play, drink, etc. It is important that students understand that while access to clean water is a basic human right, a large portion of our population lives without. Roordra (2012) states that, "By 2050 it is expected that the number of people without reasonable access to an improved water source will rise to four billion, or 45 per cent of the world's population" (p. 60). It is important that we are teaching students the value of water in order for them to care about finding creative solutions to real world problems of distribution. While the filters these grade 2 students will make will not be used to directly solve the problems Northern families are facing with boil-water advisories, this unit does teach children to be motivated to take action and to use scientific technology to address human needs. By understanding the importance of water in our daily lives, we are better able to self-assess our usage and plan for sustainable future.

Students will also have the opportunity to explore the topic of water from a holistic approach where they will engage with individuals of a variety of cultures. They will learn that it is not only people living in developing nations that have problems with water security, but also people living in Canada. As VICE Canada identifies, "Canada has the world's second-largest supply of fresh water, but 169 First Nation communities have limited or no access to it". We have the resources in Canada to ensure people have the water they need, but there is a problem with equitable distribution (Shonfield, 2010). The federal

government has responsibility for Indigenous people but the provincial government has responsibility for managing water resources. Therefore, as Gulli (2015) describes, "First Nations are left in a vacuum". It is important that students see these inequalities and learn how to move forward into a brighter future.

References:

Gulli, Cathy. (2015). Why can't we get clean water to First Nation reserves. *MacLean's Magazine.* Retrieved from http://www.macleans.ca/news/canada/why-cant-we-get-clean-water-to-first-nation-reserves/

Roordra, Niko. (2012). *Fundamentals of Sustainable Development.* New York: Routledge.

Shonfield, Graham. (2010). *Life on the Reserve: Trailer.* Retrieved from https://www.youtube.com/watch?v=evw-jXLczlo

Vice Canada. (2016). *Canada's Waterless Communities: Neskantaga.* Retrieved from http://www.vice.com/en_ca/video/canadas-waterless-communities-neskantaga

Core Competencies UNECE

United Nations Economic Commission for Europe Strategy for Education for Sustainable Development. (2011). *Learning for the Future: Competences in Education for Sustainable Development.* Geneva, Switzerland: United Nations

Learning to Know: Achieve Transformation

How engagement in real-world issues enhances learning outcomes and helps learners make a difference in practice.

Learning to Live Together: Holistic Approach

Actively engage different groups across generations, cultures, places and disciplines.

Learning to be: Holistic Approach

Is inclusive of different disciplines, cultures, and perspectives, including indigenous knowledge and worldviews.

Learning to be: Envisioning Change

Is motivated to make a positive contribution to other people and their social and natural environment, locally and globally.

Access to Clean Water

Lesson 1

Personal Water Usage

Before students can understand the differences among access to water they first must understand how much and often they use water in their daily life.

Objectives:

2-4-09 Identify sources of drinking water, and explain how this water is distributed in one's own and in other communities.

2-4-10 Describe different uses of water by humans. *Examples: drinking, washing, cooking, canoeing, irrigating...*

2-4-14 Record personal use of water, and identify ways in which they can reduce water usage. *Examples: rather than leaving water running while brushing teeth, turn off tap to reduce usage...*

Activate:

On chart paper, brainstorm all of the ways that we use water. Include daily uses for cleansing and cooking as well as recreational purposes.

Acquire:

Once students have come up with as many uses as possible have them complete the 4 quadrant chart worksheet, drawing and labelling 4 ways that they use water. See example below & Appendices 1:

<table>
<tr>
<td> 
Washing hands</td>
<td> 
Shower</td>
</tr>
<tr>
<td> 
Water Slides</td>
<td> 
Drinking</td>
</tr>
</table>

Apply:

Send students home with the following chart to record their personal water use for 24 hours. Appendices 2:

Water Use	At Home	At School	Other
Bathroom			
Washing			
Brushing Teeth			
Recreation			
Drinking			

Once charts have been returned to school calculate class totals and reflect.

Access to Water

Lesson 2

Comparison to Northern Community

Once students have a good understanding of the quantity and frequency of water they are using each day, they can be introduced to the reality that this is not the norm for everyone.

Objectives:

2-4-11 Explain and appreciate the importance of clean air and water for humans, plants, and animals.

2-4-12 Identify substances that pollute air and water, and describe ways of reducing such pollution.
Examples: car exhaust, smoke, carbon monoxide, oil, house paints, and sewage...

2-4-13 Recognize that clean water is an increasingly scarce resource in many parts of the world, and describe consequences of a shortage of clean water.

Activate:

Take the children's 4 quadrant drawings and post them on the wall, board or somewhere visible to students. While they are watching, tell them that they are going to learn about all of the ways that people in Northern communities use water in their daily lives. Go through each drawing and using a post it note, cover up the pictures that are not possible in Northern Communities.

Ex.

Drinking water from tap- could get ill

Having a bath- contaminants could hurt your skin

Water Fights- no extra water available for recreation use

Acquire:

Don't supply the students with the 'why' of the Northern Communities water deficits. Instead, have them generate questions based on the spots that the post-it notes are covering.

Ie. Why can't they drink from the tap? How do they get water they can drink? Can they play any water games? How do they wash the dishes?

Apply:

Using skype, connect with a Northern Community that is under a boiling water advisory and have the children ask a member of the community their questions.

Have students use their individual blogs to write about what they have learned from the answers, how this makes them feel and anything else they still wonder about.

Access to Water

Lesson 3

Water Purifier

Now that the students have an understanding in the availability of clean water they can begin looking at solutions or ways that they can help. This build on their citizenship learning and supports them to feel empathy.

Objectives:

2-0-1a. Ask questions that lead to investigations of living things, objects, and events in the immediate environment.
2-0-1c. Identify practical problems to solve in the immediate environment
2-0-2a. Access information using a variety of sources. *Examples: elders, simple chapter books, concept books, CD-ROMs, Internet...*
2-0-3b. Create, with the class, a plan to solve a problem or meet a need. *Examples: identify simple steps to follow, prepare a drawing of the object to be constructed...*
2-0-4a. Follow simple directions, and describe the purpose of steps followed
2-0-4b. Construct an object or device to solve a problem or meet a need.
2-0-4c. Test an object or device with respect to pre-determined criteria.

Activate:

Have students log onto the classroom blogs and comment/respond to each other's reflections after their skype connection with the Northern community. Through discussion, have the students share their thinking with others. Watch the 1 minute video http://youtu.be/GSiLTFcWzqg to see how one resident has to walk to her Aunt's house to get water and how she feels when the water truck finally comes to her house after 3 months.

Acquire:

Arrange the students in pairs or groups and have them brainstorm possible solutions or ways to help the Northern communities with their lack of access to clean water. Give students 30 minutes to research on the internet other possible solutions using a search engine such as *Nettrekker* that is designed to find websites that are appropriate for children. After 30 minutes are up have each group prepare a 1-2 minute verbal presentation trying to encourage their classmates that this is the best option to help Northern communities.

Apply:

After learning about all of the creative ideas that students have shared, introduce the idea of a water filter. A homemade water filter is meant to replicate the natural purification that happens in our environment. Each student will create and test their own filter. Appendices 3.

The following materials are needed:

-plastic water bottles or pop bottles
-coffee filters
-gravel
-sand
-rocks
-dirty water (water mixed with soil)

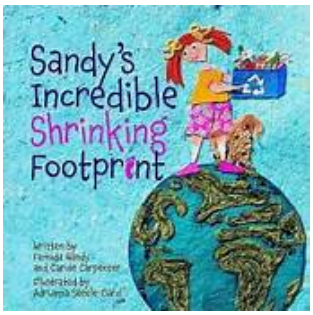
Step 1: Cut the bottle in half. Insert the top half into the bottom to look ike a funnel
Step 2: Line the bottom of the funnel shaped part of bottle with coffee filter.
Step 3: Add sand (amount will depend on size of bottle but should cover about 2 inches of bottom of filter).
Step 4: Add the same amount of gravel.
Step 5: Add rocks to finish off the filter.
Step 6: pour some of the dirty water into the bottle. Watch as the water drips out the bottom clearer than it went in.
Step 7: repeat this process until water is clear.

The following videos show the creation of the water filter:
http://youtu.be/RqWV7ozfFNQ or http://youtu.be/ZNyhY9dR2VE

Once filters are complete, have students draw a picture of their water filter and explain how it works to check for understanding. Appendices 3.

Supplementary Readings, Videos and Websites

Books



Sandy's Incredible Shrinking Footprint

Written by: Femida Handy and Carole Carpenter

Sandy loves going to the beach at her Grandpa's house. One day she comes across a pile of garbage that is ruining the beautiful beach. Through "Garbage Lady", Sandy learns about an ecological footprint and everyone's responsibility to shrink it.

Save Water

Written by: Kay Barnham

This easy to read book with lots of great pictures explores where water comes from, how water can be polluted and why we should save water.

Water Splash – Taking care of your planet

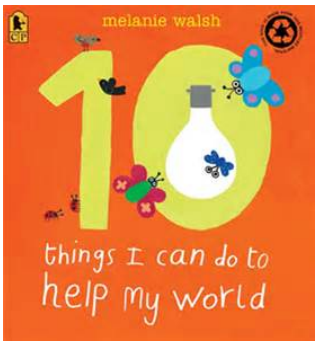
Written by: Nuria and Empar Jimenez

In this colourful picture-book, children learn about the importance of water in the lives of all people, plants and animals. Children discover ways to conserve water.

Love your world – how to take care of the plants, the animals and the planet.

Written by: Dawn Sirett

This beautiful book is full of photographs of children taking care of the earth. Kids learn how they can make a big difference through activities such as growing a garden, recycling trash and reusing



10 Things I Can Do To Help My World

Written by: Melanie Walshj

This colourful and engaging picture book gives young kids ten simple things that we all can do to help the world.

Videos

1. Wonder Grove Kids

http://www.wondergroveplay.com/video/save-water/

This is a great kid-friendly video that talks about why water is a valuable resource, the importance of conserving and ways kids can help.

2. Water – Who Needs It? By calwater

https://www.youtube.com/watch?v=l67HwLegDLE&feature=em-share_video_user

This 14 minute video geared toward very young children talks about the importance of water. It discusses what would happen without water, ways people use water, how people waste water, problem with polluted water and ways to save water.

Teacher Websites

http://www.partselect.ca/Resources/Teaching-Kids-About-Water-Conservation.aspx

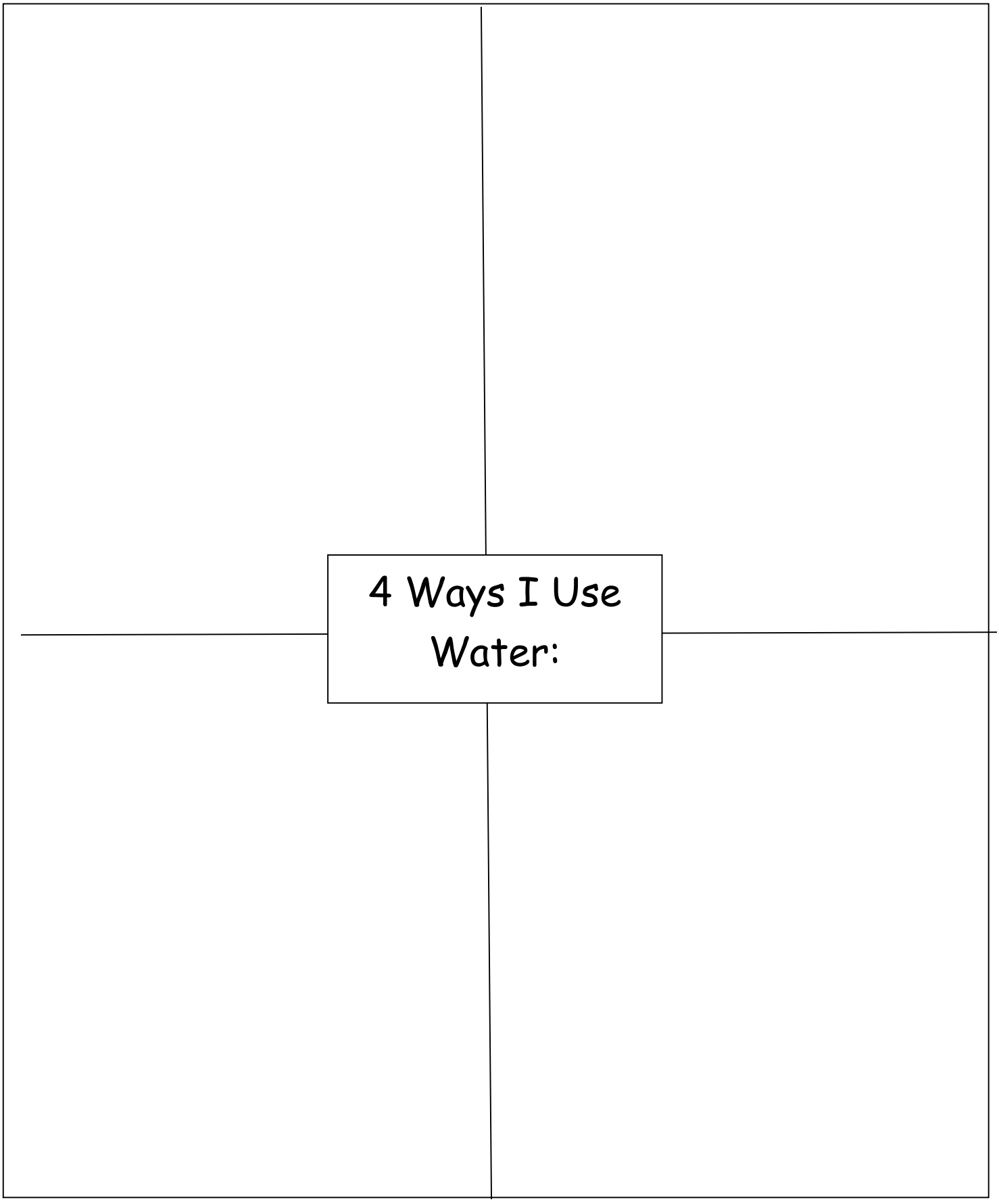
http://www.thewaterpage.com/water-conservation.htm

Manitoba Science Curriculum Outcomes

Manitoba Curriculum Framework of Outcomes. (1999). *Kindergarten to Grade 4 Science.* Winnipeg, MB: Manitoba Education and Training

http://www.edu.gov.mb.ca/k12/cur/science/outcomes/k-4/grade2.pdf

Appendices 1:



Appendices 2

Water Use	At Home	At School	Other
Bathroom			
Washing			
Brushing Teeth			
Recreation			
Drinking			

Adapted from Manitoba Science Curriculum: A Foundation for Implementation

Appendices 3

Draw a picture of your water filter:

Explain how your water filter cleans water: