

# PRIMARY

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# **WATERSHED LESSON**

## **KINDERGARTEN – GRADE 4**

### **Materials List**

- **Water Demo:**
  - 2 jars – each big enough to hold about 500 ml of water
  - a tablespoon measure
- **Watershed Poster**
- **Die or number cards** with section titles for Review Quiz- page 11

### **Presentation Set-up:**

1. **Watershed Poster** ready for viewing beginning with page 6 discussion
2. **Water demo**
  - Fill the ‘Earth’s Water’ jar with 500 ml of water
  - Have the ‘not drinkable water’ jar beside (empty)
  - Have the tablespoon ready for the demo

# PRIMARY WATERSHED LESSON

GRADES K – 4

## BACKGROUND INFORMATION

Fact:

Did you know?

- The Earth is known as the “water planet”
  - Approximately **70% of its surface** is covered in water
    - Hold up 10 fingers – then show 7 fingers representing water and 3 being land
    - Has anyone seen an ocean? - *show of hands*
    - Does anyone know the name of the Ocean by Vancouver?
    - Oceans are really large compared to lakes
  - Water never stays in the same location; it is constantly **changing** – from snow or rain falling on the Earth, moving over the earth in streams, rivers and lakes and then evaporating and going back up to the sky to be able to fall again as rain or snow

Fact:

Did you know?

- Survival of all living things depends on water
  - Every **plant and animal** depends on water

- Fish live inside water
- Humans, trees, plants, etc. grow and maintain their health by using water
- **Clean, fresh drinking water** is necessary for us to survive

We are now going to demonstrate how much water on Earth is drinkable.

## WATER DEMONSTRATION

Materials: Two clear containers that can each hold about 500 ml of water and one tablespoon measure. One container should be filled with 500 ml of water. Label this one 'Earth's Water'.

- Hold up the container with 500 ml of water for everyone to see.
  - 'This represents all the water in the entire world, how much do you think would be fresh and available to drink?'
  - Ask for a volunteer to help out.
- Then say 'My helper is going to pour the water out of the container that represents the water that is **not** drinkable and the water left inside the container represents the water that is drinkable'
  - Have the class tell when to stop pouring the water.

*The fun part of this demo is allowing the students to decide when to stop pouring the water. They will be amazed at the amount of water that is not drinkable and how little is available for human consumption. Students will usually want to stop too soon.*

- Presenter should then take over. Stop pouring once you have poured out 97% (485ml) of the water and explain that all the water poured out is 'salty' and found in our oceans. The water left in the container (3%, 30 ml or one tablespoon) is considered fresh.
- Pour the 'fresh' water into the tablespoon and explain that some of the water in the tablespoon is not available for use. Ask the students why the water might not be available for use – *it is either trapped underground or in glaciers*. Hold up 3 fingers to show 1/3 is ground water, 1/3 is in glaciers and 1/3 is available for use. Pour the 'fresh' water that is not available back into the Earth's Water jar.
- Show the students there is about 3 ml (1/2 a teaspoon) left in the tablespoon and explain that the amount left, represents all the fresh water on the planet available for us to use.

*This demo should help students to realize that clean water is a very limited and a valuable resource that we should all understand our water sources and help protect them.*

## USES OF WATER

### Mini review:

- What is something new you have learned today?  
*Take a few answers*

Now we are going to discuss the **Uses of Water...**

### Fact:

#### Did you know?

- You could live without food for up to three weeks, but you could only last three or four days without water. Raise your hand if you used water this morning before you left for school.

### Question:

How did you use water this morning? You would probably be surprised to see that you used more water than you think.

### Possible Answers:

1. **Flush toilet**
2. **Shower** or bath
3. **Clothes** – washed in water
4. **Clean dishes** – washed in water
5. **Breakfast** – cooked in water or contain water (i.e. oatmeal, juice)
6. **Brush teeth** with water

### Fact:

#### Did you know?

- On average you probably used water at least 6 times in the morning  
– approximately 40 gallons or 1.5 bath tubs full:

### Question:

What are some ways people use water outside their home?  
*Take a few answers*

### Possible Answers:

- **Travel** – get from place to place – i.e. Ferries, boats
- **Recreation** – fishing, boating, skating, swimming, etc.

- **Cleaning things** – washing cars, quads, motorbikes, etc.
- **Manufacturing** – making products – (plywood, clothing, food)
- **Agriculture** – water plants that grow food – (i.e. corn, wheat, vegetables)
- **Hydro Power** – water from rivers to produce electricity
- **Gardening** – water lawns, flowers, and gardens

## WATERSHED PROCESSES

### Mini Review:

- Who remembers what the Earth is called? – *the Water Planet*
- How many days can we survive without water? – *3 or 4 days*
- Where is some of the water that is NOT available for use? – *glaciers and groundwater*
- How much water do we use each day on average? – *1 \_ bath tubs full*

Now we are going to learn about **Watersheds...**

### Definition:

A watershed includes all of the water and all of the land that drains into a common area such as a river or lake.

A watershed is high on the edges and low in the centre where the waters flow.

### ***Show students with your hands:***

- *high on the edges coming down low in the centre*
- *(again) high on the sides and 'shedding' water to the valleys or low areas of land*

Fact: No matter where you live, work or play, you are **ALWAYS** in a watershed.

### How Watersheds Work:

#### Show the **Watershed Poster:**

*Follow the path that water takes as you discuss:*

#### **Inputs:**

- rain/snow on the mountains

Note: *remember the changing and moving from our earlier discussion*

#### **Outputs:**

- flowing into streams
- into rivers
- or underground
- down to lakes in the valley bottoms

- out of the lakes into rivers again
- then into the ocean

## SOURCES OF WATER IN WATERSHEDS

### Fact:

Water is stored in different places on Earth.

### Question:

Can you name some of the places on Earth where water is stored?

- *If needed – remind the students that some places were just mentioned*

### Answers:

Lakes, rivers and streams, groundwater, wetlands, glaciers and snow

These are all places where water is stored in '**Watersheds**'.

- *Show each one of the sources on the **Watershed Poster***
- *For Grades 2 to 4 – write each source on the board*

Let's look at each of the places where water is stored in a watershed.

### 1. Lakes, Rivers and Streams

*Using the **Watershed Poster**, follow the flow of streams into rivers and then into lakes:*

- Lakes, rivers and streams make up 'watersheds'
- Melting waters escape by the streams and rivers for water on the surface
- Rivers then **flow into and out of lakes**. The importance of lakes is that they are able to **store water** during times when there is a lot of water and then release the water slowly.

### Fact:

Canada is famous for its number of lakes. There are at least **two million** lakes of all sizes in Canada.

### Question:

Can you name some local lakes and rivers?

## 2. Groundwater

- Groundwater is water **found beneath the Earth's surface** much like giant sponges
- Groundwater is **connected with lakes and rivers** and often emerges as streams
- Groundwater is an important **source of freshwater** that supplies towns, farms and industry

Fact:

**Did you know?**

Grades 2 and 3 students: One very small province in Canada depends on groundwater for its entire water supply. Would any one like to guess which province that is? – *Prince Edward Island*

- i. Groundwater is accessed by drilling a well underground
- ii. Have students name someone they know or perhaps a town that uses a well for their water.
- iii. Have the students identify where their community water comes from.

## 3. Wetland Areas

- Are **strips of land** that border lakes, rivers and streams – *show the areas on the Watershed Poster*
- Act as **filters or giant sponges that collect sand or dirt**
- Protect fish and wildlife habitat – *what does the word habitat mean?*

## 4. Glaciers

- Are huge **masses of ice** in the high mountains with frozen freshwater  
*Has anyone seen a glacier? Point to the glaciers on Watershed poster*
- The ice **melts in the hottest part of the summer** and feeds rivers during hot summer weather when other sources of water may be dried up.

Question:

We have glaciers in BC and Alberta. Can anyone name an area where there is a glacier?

Answers:

Headwaters of the Adams River, Blue River, Glacier National Park, Lake Louise in Banff National Park

*Has anyone been to any of these places? Show of*

*hands*

## 5. Snow

- Is a major **reservoir of water**, which melts during the spring  
*Did we have lots of snow this year?*
- **Water levels** are generally high after snow melts and go down during the summer.

# HEALTHY WATERSHED

## ACTION ACTIVITY

### Mini review:

- What new things have we learned today? – *take a few answers*

Now we are going to learn about how to keep a **watershed healthy**.

There are two parts to this section:

- 1) how nature keeps a watershed healthy
- 2) how we can help to keep a watershed healthy

### Fact:

#### Did you know?

- Trees and other plants help our watersheds.

### Action Activity:

- Have the students stand up. They are going to be trees and/or plants helping to keep watersheds healthy.
  - Pretend their feet are their roots and their toes are their roots growing – *bend over wiggle your toes so the roots grow*
  - Water is taken up through the ‘roots’ into the trunk of the tree – *have the students use their hands to follow the flow of the water*
  - Water is now going out to the branches – *spread your ‘branches’ and wiggle your fingers or ‘leaves’*
  - Water is now out into the leaves and the nice sun warms the leaves and evaporates the water from the leaves.
- Hold your hands up and explain that the evaporated water goes into the clouds so it can come back down to earth as rain or snow.
- You have just demonstrated the ‘Water Cycle’ with evaporation, condensation and precipitation

## A. HOW NATURE KEEPS A WATERSHED HEALTHY

### 1. WATER QUALITY – How do Trees and Plants Help?

- Roots of trees and other plants take up the water and leave behind the dirt, sand and pollution.
- Some water is **used within the body** of the tree or plant but most travels up through the tree or plant to the **leaves or needles**. When water reaches the leaves, it is exposed to the air and the sun's energy and then is easily **evaporated into the air**.

### 2. SOIL EROSION – What is it?

- The roots of trees and other plants prevent soil erosion (or wearing away) by **slowing down surface** water and making **stream banks strong**. – *entwine your fingers to show roots matted together holding soil*
- The roots act like giant **sponges**, soaking up the rain during storms.

### 3. SOIL COMPACTION – How do trees and plants help so soils do not become 'compacted' or firmly packed together?

- **Roots push through the soil** as they grow and **prevent the soils from packing together** too tightly, allowing rain and melting snow to easily go into the earth. – *Remember your toes (roots) growing through the soil to loosen it?*

## B. HOW WE CAN HELP TO PROTECT OUR WATERSHEDS

### 1. Watershed Protection- what can we do?

- Conserve water at home:
  - i. Turn off tap while brushing teeth
  - ii. Shorter showers
  - iii. Turn taps on halfway not full
  - iv. Water yard in cooler periods
  - v. Sweep driveway instead of washing
  - vi. Low water setting for small laundry loads

- When spending time in or near a watershed:
  - i. don't leave garbage or pollution behind
  - ii. use an electric motor or paddles when boating instead of a gas motor so gas does not spill in the water
  - iii. don't drive along wet areas or in streams with motor bikes, quads or horses, as it could pollute or damage
  - iv. use environmentally friendly paint balls
  - v. stay on main roads and trails when riding or walking to reduce erosion

## Review Quiz

### Method:

Choose students to roll a die or pull number cards 1 – 6 with the section titles on them. State the category that the review question will be asked. You may not have covered all the information so change questions to suit the situation.

<b>1. Water &amp; Watersheds</b>	<b>2. Lakes, Rivers &amp; Streams</b>
Earth is known as what kind of planet and why? - water planet, 70% covered in water	Where do melting waters from the mountains flow? - into lakes, streams or tributaries
How do we use water in the morning? - any reasonable answer	About how many lakes are in Canada? - 2 million
Can you describe a watershed? - water drains into area - high on sides, low in centre	Can you name a lake, river or stream in the area? - any reasonable answer
Where is some fresh water trapped? - ground water - glaciers	How are lakes, rivers or streams important to the watershed? - water source and storage
<b>3. Groundwater</b>	<b>4. Wetlands</b>
Where is groundwater found? - under the earth's surface	Where are the wetlands? - border lakes, rivers and streams
How do we get water out of the ground? - springs or drilling wells	What does the word habitat mean? - homes
What tiny Province uses groundwater? - Prince Edward Island	Wetlands are areas for whose habitat? - any reasonable answer – land or water
<b>5. Glaciers &amp; Snow</b>	<b>6. Healthy Watersheds</b>
Where do we find glaciers? - high in the mountains	How do trees and plants help with water quality? - roots take up water
How is the water stored in glaciers? - huge masses of ice	How do roots help soil not become packed together - roots grow through the soil
Why is snow important? - melts into lakes, rivers and streams	How can we protect our watersheds? - any reasonable answer