

# Just a Drop in the Bucket

**Activity Overview:** Although the Earth is covered mainly by water, only a small amount is available for drinking. Using graduated cylinders to demonstrate the world's water supply, we will show just how much of this water we can actually use.

**Objectives:**

Students will learn that:

- Water is a limited resource
- Water can be taken from above or below ground, and is only plentiful in some countries

**Materials:**

- 1-2 eye droppers
- 2 large graduated cylinders (1 marked at 1L, 1 marked at 970 mL)
- 2 small graduated cylinders (1 marked at 20mL, 1 marked at 10 mL)
- 4 laminated photo cards – all water, salt water, fresh water, frozen water
- Container to hold water
- Globe (for display purposes)
- Squeegee (to wipe down table throughout the day)

**Set-up:**

- You will need to have all **four** graduated cylinders laid out.
- Put the laminated photo cards in front of the appropriate graduated cylinders. Flip them over so the students do not see the front of the card. 1000ml= All of the water on Earth, 970ml= Salt Water, 20ml= Frozen Water, 10ml= Fresh Water.
- Fill the first graduated cylinder to 1000 mL. This represents “ALL of the water on the earth”.
- Leave the rest of the graduated cylinders empty for now.

**Takedown:**

- Please note once the event is over for the day, all the materials need to be put away.
- Items should be placed all into one box labelled “Just a drop in the bucket”.
- Make sure that the graduated cylinders and all containers with water are emptied and dry.
- Use the squeegee throughout the day to wipe excess water off the table.

**Vocabulary:**

- **Groundwater** – Water that is found underground in the spaces and cracks between soil.
- **Aquifer** – A natural underground area where large quantities of groundwater fill the spaces between soil, sand, gravel and rock.

**What will I be doing? (Procedure)**

*Before you start your presentation check with the teacher or chaperone that the entire group is present and ready to start.*

*Remember that **doing** an experiment and **discovering** the answer is more powerful than watching and listening to someone, so try to involve as many children as possible.*

**Say:** "Welcome to Just a Drop in the Bucket. We will be learning about how much water there is on Earth and how much of that water is actually available for us to drink. We will learn that it is important to keep our source of drinking water pollution-free because there is only a limited amount of water available for drinking."

**Ask:** "What do you use water for in your daily lives?"  
*Encourage them to think of indoor uses and outdoor uses of water.*

**Ask:** "Where do we find water on earth?"  
**Answers:** *Oceans, lakes, streams, rivers, underground in aquifers and frozen in glaciers*

**Say:** "Groundwater is water that is found underground in the spaces and cracks between soil. The underground areas with a lot of groundwater are called aquifers."

**Ask:** "Why are we so lucky to live here in Peel Region?"  
**Answer:** *We have access to clean water.*

**Ask:** "What water source do we live near?"  
*Point to where we are on the globe.*

**Say:** "That's right, the Great Lakes! The Great Lakes are very important because they have 20% of all the freshwater on Earth!"

**Ask:** "Which Great Lake we are close to in Peel?"  
**Answer:** *Lake Ontario. Have the students look at the globe to see just how much water there is on the earth.*

*Show students the graduated cylinder filled to 1000ml (1 litre).*

**Say:** "This container holds 1 litre of water. For this activity, let's pretend that all of the water on the earth, including glaciers and groundwater, takes up 1 litre."

**Ask:** "Guess how much of that 1 litre of water represents the amount of salt water in the oceans?"  
*Refer to the globe. Get them to point to the graduated cylinder with the black line that would represent the amount of salt water. This would be the one marked 970ml.*

*Pour water from the first 1L graduated cylinder up to the 970mL fill line in the second graduated cylinder.*

**Say:** "This is the amount of the earth's water that is found in the oceans as salt water."  
*Flip the photo card "Salt Water" in front of the graduated cylinder*

**Ask:** "Why can't we drink salt water?"  
**Answer:** *Our bodies are not able to process salt water properly. Too much salt in our bodies makes us dehydrated, so we need water that does not have salt in it. Marine animals have organs that can remove large amounts of salt from their bodies.*

**Ask:** "Guess how much of the world's water is frozen?"

*Ask them to point out what graduated cylinder would represent frozen water. Then pour water from the original 1L graduated cylinder up to the black line of the small graduated cylinder marked at 20mL. Tell them that this represents the amount of earth's water that is frozen. Flip the photo card "Frozen Water" in front of the graduated cylinder.*

**Ask:** "Guess how much of the world's water is fresh?"

*Pour from the original 1L graduated cylinder into the one you have marked at 10mL. Flip the photo card "Fresh Water" in front of this graduated cylinder.*

**Say:** "Even though this is fresh water, we can't drink most of it either."

**Ask:** "Do you know why we can't drink most of this fresh water?"

**Answer:** *Most is groundwater, polluted and/or trapped in soil.*

*Use the eyedropper to put one drop of water from the 10mL cylinder into the palm of a student's hand. Explain that this is all of the available fresh water we have to share on this planet.*

**Ask:** "What are some ways that we can conserve this water?"

**Answers:**

- Turning off the tap when brushing teeth and lathering up (for showers and hand washing)
- Taking shorter showers
- Use a jug of water in the fridge, or ice cubes for a cold glass of water, instead of running the tap until it gets cold.

**Remind the students before they go:**

- Only a very small amount of the world's total water is available for human consumption
- The water that is available is not distributed evenly around the world (some countries have very little, some, like Canada, have a lot)
- Conserving water is important everywhere in the world!
- Keep our lakes and well water pollution-free because there is only a limited amount of water available for drinking.

**Say:** "Thank you for joining us for Just a Drop in the Bucket! We hope you had fun and learned something new!"

**Background Information:**

- Most of the earth consists of water, there is much more water than there is land.
- About 70% of the earth's surface is covered in water, but water also exists in the air as vapour and in aquifers in the soil, as groundwater.

**World Water Distribution/Availability:**

- 97% of the world's water is SALT WATER
- 2% of the world's water is FROZEN in polar ice caps and glaciers
- 1% of the world's water is FRESH WATER and of that most is unavailable (too far underground, polluted, or trapped in soil, etc.) for human use
- Only 0.01% of the total water on earth is accessible for humans to consume

**Great Lakes Info:**

- The Great Lakes hold 20% of the world's surface fresh water
- Forty million people live in the Great Lakes basin

## Purple Colour Group- Intermediate

- All aspects of the natural environment, from weather and climate, to wildlife and habitat are affected by the Great Lakes system
- The long history of agricultural and industrial development has placed the Great Lakes basin's ecosystem under tremendous stress. The challenge is to minimize the pressures on the environment by changing the way we live and do business.

