

Grade 6

How much do we really use?

**Public Education and Outreach:
peelregion.ca/enviroed**





Teacher Note:

- **(Click-1)** Ask students – what city or town do they live in?
 - Let students know the city or town they mentioned is part of a larger area that is called the Region of Peel
 - **(Click-2)** The Region of Peel includes the Town of Caledon and 2 cities – City of Brampton and City of Mississauga
 - **(Click-3)** Peel has a population of 1.51 million people
- The Region of Peel provides services to residents. Can anyone share what services the Region of Peel may provide in our communities?
 - Recycling and Waste collection and disposal;
 - Maintenance of regional roads, including snowploughing in the winter and paving in the summer;
 - Operation of child care centres and homes for the aged
 - Ambulance services
 - Peel Regional Police services

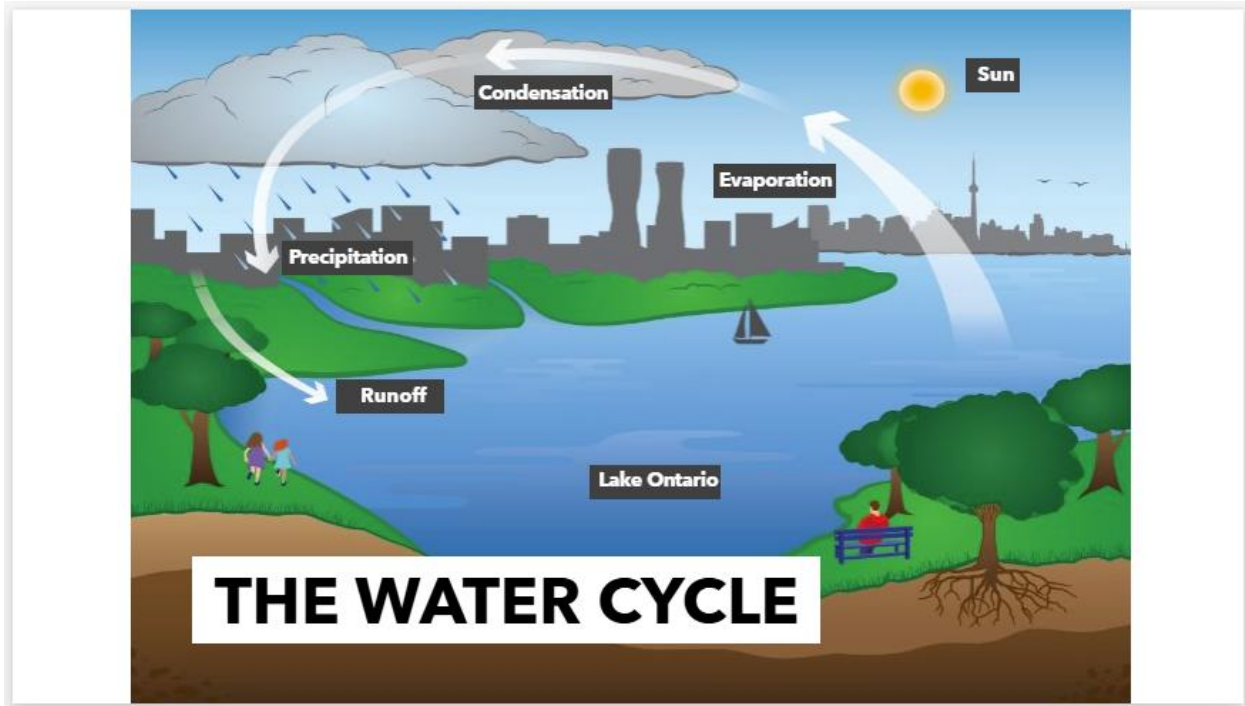
- **Peel Region also provides you with clean, safe drinking water and wastewater treatment**
- **(Click-4)** Region of Peel has 2 water treatment plants in Mississauga,
- **(Click-5)** 2 Water Resource Recovery Facilities located along Lake Ontario, and
- **(Click-6)** 15 municipal wells that treat water that we use daily
 - Most of these plants are located in Mississauga, close to Lake Ontario as it allows the Region to treat and clean water faster and more efficiently
- This short video coming up next, will look at how the Region of Peel invests in water. Listen for some interesting facts on water to share as a class after watching the video



Investing in our Water

Teacher Note:

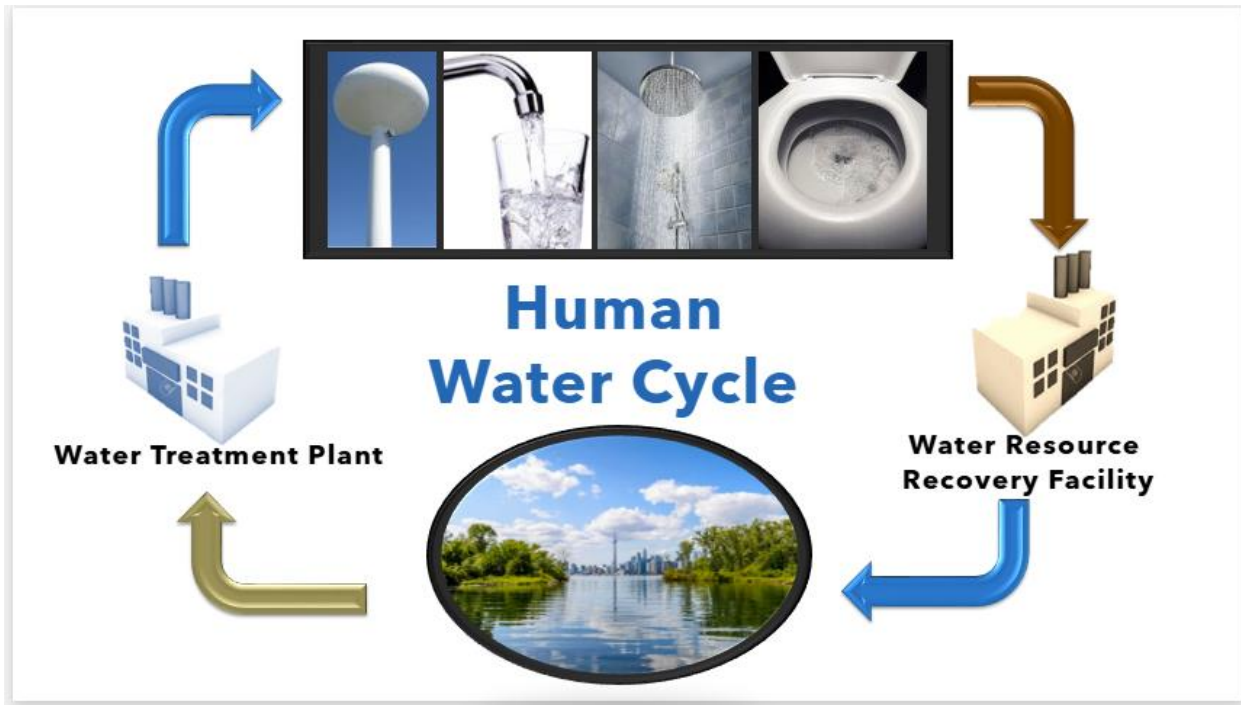
- Watch video: 'Investing in our Water'
- <https://www.youtube.com/watch?v=XMr0JqGOX0A>
- To play video, press the Play button
- Share information from the video – have students share interesting facts they heard from the video
- **Did you know?**
- Did you know that we have over 200 staff in the Region of Peel who treat and maintain our water to make sure every time you turn on the tap, the water is fresh and healthy to drink?
- And every time you flush your toilets, or take a bath, these dedicated staff also work to make sure that dirty water gets cleaned before putting it back to the lake
 - They work to make sure all our water gets treated for everyone, 1.51 million people living and working in Peel
 - Every day the Region of Peel treats 570 million litres of water
 - That's enough to fill 228 Olympic sized swimming pools



Teacher Note:

Review the water cycle with students

- Where do we in the Region of Peel get our water from?
 - Brampton, Mississauga and Bolton get water from the Lake. Other people who live in Caledon get water from wells, either on their own property, or municipal wells that are owned by the Region
 - Water from Lake Ontario is fresh, which means that the water is not salty like the water in oceans and seas
- The water cycle is a continuous circulation of water from rivers, lakes and oceans into the atmosphere onto the land and back
 - **(CLICK-1) Sun:** the source of energy that drives the whole cycle
 - **(CLICK-2) Lake Ontario:** this is our water source
 - **(CLICK-3) Evaporation:** the sun heats up the water in lakes, rivers and oceans and turns it onto vapour
 - **(CLICK-4) Condensation:** water vapour in the air gets cold and changes back into liquid form
 - **(CLICK-5) Precipitation:** the clouds get heavy and water falls back to the earth in the form of rain, hail, sleet or snow
 - **(CLICK-6) Runoff:** moves water across land and makes its way to the nearest body of water such as a lake



Teacher Note:

- **(Click-1)** Has anyone ever heard about the human water cycle? What could this be all about?
 - Have students share their thoughts
- What happens when we use water to brush our teeth, shower, go the bathroom – where does it go?
- **(Click-2)** Do we send it directly to the Lake?
 - NO
- If I was thirsty, can I go down to Lake Ontario and take a cup of water directly from the lake and drink it?
 - NO, why not? (have students share their thoughts)
 - **(Click 3)** The water in Lake Ontario might have bacteria, viruses, and germs in it. All those things could make us very sick if not treated.
 - **(Click 4+5)** That is why we have to send the water to get treated so it can be cleaned and made safe for us to drink. The dirty water travels through underground pipes and gets treated again at our wastewater plant before we return it back to Lake Ontario

The next few slides will cover how we treat all that dirty water at our water treatment plant and wastewater recovery facility

Dew's Water Adventure

<https://peelregion.videos.io/videos/ac9cd9b41d19e1c225/dews-water-adventure>



Teacher Note:

- Animated slides that will cover and explain water treatment
- Please click on the link on the slide to get to the video
 - <https://peelregion.vids.io/videos/ac9cd9b41d19e1c225/dews-water-adventure>

Discussion Questions:

- What is the purpose of a water treatment plant?
 - Before learning about water treatment, think about how we get water to our homes and schools
 - Have students share their thoughts on what they know, or heard about water treatment

Worksheet: All About Treatment

- Have students complete the worksheet while listening to the animated slides about water treatment



Peel's tap water from the Arthur P. Kennedy water treatment plant

Teacher Note:

- This short video will show footage of the Arthur P. Kennedy water treatment plant
- Watch video: 'Peel's tap water from the Arthur P. Kennedy water treatment plant'
 - <https://www.youtube.com/watch?v=J9wY-qMrqZg>
 - To play video, click the Play button

Did you know?

- That Arthur P. Kennedy Plant can treat up to 1.2 billion litres per day
- Every day the Region of Peel treats 570 million litres per day
- In the year, 2041 another 21 years from now, it is estimated that almost another 2 million people will live in Peel. That means we will have to continue treating water for even more people in Peel, a task that the Region takes great pride in doing.
- Do you think the Region of Peel can treat water for 2 million people? Explain your reasoning?
 - **Answer:** Yes, the Region of Peel can treat up to 1.2 billion litres per day. There's always room for more capacity to treat water per day in the Region. Forecasting for future population growth is something that the Region of Peel plans for

- Region of Peel is committed to providing safe and reliable drinking water to everyone

Discussion Questions:

- Do you think the Region of Peel can treat water for 2 million people?
- Explain your reasoning?
 - **Answer:** Yes, the Region of Peel can treat up to 1.2 billion litres per day. There's always room for more capacity to treat water per day in the Region. Forecasting for future population growth is something that the Region of Peel plans for
- Region of Peel is committed to providing safe and reliable drinking water to everyone

Dew's Wastewater Adventure

<https://peelregion.vids.io/videos/069cd6b81717e3c58f/dews-wastewater-adventure>



Teacher Note:

- Animated slides that will cover and explain wastewater treatment
- Please click on the link on the slide to get to the video
 - <https://peelregion.vids.io/videos/069cd6b81717e3c58f/dews-wastewater-adventure>
- **Worksheet:** All About Treatment
 - Have students complete the worksheet while listening to the animated slides about wastewater treatment
 - Take a few minutes to go over and cover the worksheet as a class



How the Region of Peel cleans your wastewater

Teacher Note:

- Watch the video: 'How the Region of Peel cleans your wastewater'
 - <https://www.youtube.com/watch?v=4uxYZdnxuz8&feature=youtu.be>
 - To play video, click the Play button
- **Did you know?**
 - The Region of Peel treats 518 million litres of wastewater per day
 - That's enough water to fill 200 Olympic sized swimming pools



Teacher Note:

- **Ask:** does anyone know what these are? Where can they be found?
 - **Answer:** on the streets, school property, parking lot
- **Ask:** what is the difference between the 2?
 - **(CLICK-1) Answer: Sanitary Sewers:** access point for trained professionals to go down to access the pipes. These trained professionals can open these and if you were there when they opened it, all you would see would be pipes. If there is a blockage or a break in the pipes, they might open this up to fix it
 - **(CLICK-2) Storm Sewers:** used for rain/snow collection so the streets don't flood
- **Ask:** where do you think the water goes from the storm sewer? Does the water get treated?
 - **Answer:** No, the water goes untreated directly to a stream, creek and eventually to Lake Ontario

- **Ask:** what do you think can be put down the storm sewer?
 - Discuss the effects of the biodiversity of the Lake. (pollution, garbage, chemicals, soaps all going to the Lake without getting treated), what would the water quality be like?
 - It is against the law to put anything down a storm sewer other than rainwater or snow, because it can be harmful to the aquatic life in the Lake. Therefore, it is important to not pour any motor oil, paint, or any other fluids that could potentially harm the aquatic life and pollute the water we depend on for so many things
- We need to protect the water we have, as you will notice in the last exercise of this lesson how much water we actually use



Where is water?

Teacher Note:

- Watch the video: 'Where is water?'
 - <https://www.youtube.com/watch?v=b1f-G6v3voA>
 - To play video, click the Play button
- Cover the difference between physical and virtual water by calculating your own water footprint. Have students watch this short video:

Discussion Questions after the video:

- How much freshwater is available on earth? **Answer:** 2.5% of the world's water makes up freshwater
- What makes up the total amount of surface water? **Answer:** 1.2%
- What amount of water makes up the agricultural industry? **Answer:** 70%
- What are some advantages and disadvantages to the biodiversity of agricultural practices on land and water? Discuss with the class
- Can you describe in your own words what is virtual and physical water?
- The next few slides will be an activity for students to calculate their own water footprint
- Students will need GOOS paper to track their results

Our Water Footprint - Shower

How many times a week do you shower?

- a) 1-2 times a week (1 point)
- b) 3-4 times a week (2 points)
- c) 5-6 times a week (3 points)
- d) 7 or more times a week (4 points)

How long does your typical shower last?

- a) Less than 5 minutes (1 point)
- b) 5-10 minutes (2 points)
- c) 10-15 minutes (3 points)
- d) More than 15 minutes (4 points)



Our Water Footprint - What we eat

If you consume red meat, how many times a week do you consume it (e.g. beef, pork)?

- a) Never (0 points)
- b) 1-2 times a week (1 point)
- c) 3-4 times a week (3 points)
- d) 5 or more times a week (5 points)



Our Water Footprint - What we drink

Do you drink tap water or bottled water?

- a) Always tap water (1 point)
- b) A mix of both (2 points)
- c) Always bottled water (3 points)



Our Water Footprint - What we buy

How often do you go shopping for clothes?

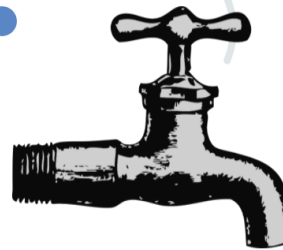
- a) Almost never (1 point)
- b) Every couple of months (2 points)
- c) Once a month (2 points)
- d) Once a week (5 points)



Our Water Footprint - what we watch

How many hours a day do you spend in front of a screen (TV, computer, phone, etc.)?

- a) Less than 1 hour (1 point)
- b) 1-3 hours (2 points)
- c) 3-5 hours (3 points)
- d) More than 5 hours (4 points)



Our Water Footprint - transportation

How do you usually get to school?

- a) Walk or bike (0 points)
- b) Bus (1 point)
- c) Carpool with friends (3 points)
- d) Get a ride to school (4 points)



Our Water Footprint - what we wear

What do you do with your old clothing?

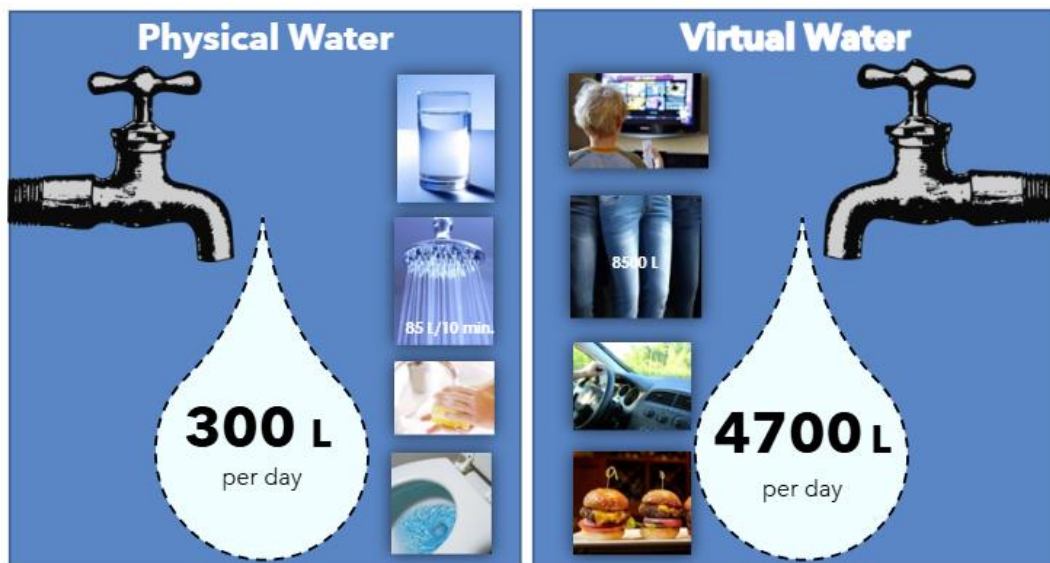
- a) Donate or recycle (0 points)
- b) Use it for rags (1 point)
- c) Throw it away (3 points)



Teacher Note:

- Have students answer a total of 7 questions
- These questions will tally each student's water footprint
- Have students tally their points using GOOS paper or their journal

Our Water Footprint



Teacher Note:

- Take some time to go over the 'Water Footprint' activity with the class
- Physical Water = direct uses of water, water that we use for drinking, showering, washing hands and flushing toilets
- Virtual Water = non-direct uses of water, water that we can't see, touch, taste or feel, and it makes up a big part of our water footprint
 - We wear water, it takes 8500L of water to make 1 pair of jeans
 - Furniture, houses, cars, roads, all these things we build, also needs water
 - We also spend money on generating electricity with our phones and watching TV which also uses water and
 - Farming uses huge amounts of water and
 - Many other uses of water that we use daily
- Have students calculate their own water footprint to get a value, refer to handout
 - **Below Average (6-11 points)**
 - **Average (12-20 points)**
 - **Above Average (21-32 points)**

Discussion Questions:

- **(Click-1)** Can anyone guess the average water usage per Canadian?
 - **(Click-2)** The average water usage is about 300 L per day in Peel, and this is physical water, like taking a shower, washing our hands before we eat a meal, but when we consider our virtual water usage, our average jumps to **(Click-3)** 4700 L per day!!!! That's a lot of water! In fact, **Canadians are among the highest consumers of water in the world!**
- If you're above average user, the purpose of this exercise is not to make anyone feel guilty, but to be more aware of how much water you use. Remember that our freshwater we have available is 1.2%. So it's important that we conserve the water we have for future generations to be able to enjoy.
 - What does conserving water look or mean to you?
 - Think about some adjustments in your own life that you can make to help conserve our water?
 - Just a 10-minute shower can use up to 85 L of water



Teacher Note:

End of the lesson, ask students

- What have they learned today about water?
 - Have students share their findings
- Share with students that everyone including them, have a part in protecting and conserving water
- For more information on water education, please visit our new website:
<http://www.peelregion.ca/enviroed>