The AVA Project

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the AVA project
a FEZANA initiative

Water Scarcity and Conservation

How do you use water?

Image Source:
https://www.cleanpng.com/png-earth-world-water-day-water-conservation-water-eff-251329/

Small Group Activity:

- discuss how you used water today
- draw pictures and write words to describe the ways in which we use water on Earth
- be ready to share!

Teacher Notes:
Have students form into small groups. Provide each group with a piece of chart paper and some markers. (If concerned about sharing items due to Covid-19, assign roles to each group member - i.e., recorder, timer, presenter, etc…)

- have students share where they last used water - encourage them to use both pictures and words → let the students take the lead and see how they categorize their use of water (i.e., for hydration, cooking, sanitation, agriculture, recreation, etc…) and use this as a point of discussion when the different groups share/present
- discuss where the water in your area comes from → get students thinking about the source of that water (i.e., Lake Ontario is the source of tap water in Toronto)

Image Source:
https://pixabay.com/vectors/drop-face-liquid-rain-raindrop-148199/

Why Should We Care?

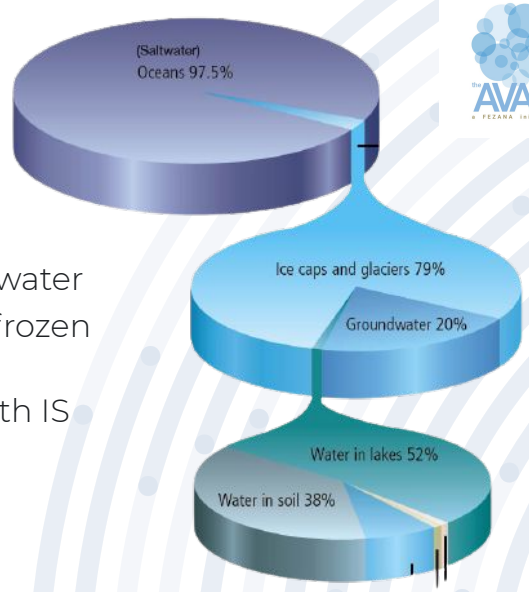
Clean drinking water is unavailable in many parts of the world.

Image Source:
https://www.cleanpng.com/png-earth-world-water-day-water-conservation-water-eff-251329/

Water on Earth

Did you know that...

- 97% of the water on Earth is salt water
- 2% of the freshwater on earth is frozen in glaciers and icecaps
- less than 1% of freshwater on Earth IS accessible to humans



Teacher Notes:

- 97% of all the water on Earth is salt water - found in oceans
- 3% of the water on Earth is freshwater, BUT not all of it is accessible
- 2% freshwater is either in our atmosphere, frozen in glaciers, ice caps and permafrost, or deep below the Earth in underground reservoirs and aquifers
- less than 1% of freshwater on Earth is accessible by humans - surface water (i.e., streams, rivers, lakes, swamps, …)
- not everyone has access to freshwater sources

Image Source:
https://sanits591.wordpress.com/2012/11/12/water-distribution-on-this-planet-earth/

Human Activities Affect Our Water Supply

Negative Human Impact:

- pollution and contamination of water sources
- overuse
- agricultural and industrial practices
- water diversion and export

Teacher Notes:
- there are a number of factors that hurt our freshwater supply, but overuse and misuse tend to be the most prevalent
- pollution and contamination cause our freshwater sources to be non-potable
- the water cycle naturally recharges our groundwater, but overuse of wells can drain aquifers
- farming and other industries use large amounts of water and often return the water to the environment after it is used - this discharge often has contaminants in them
- the water bottle industry is removing large amounts of water from our supply - this is shipped to other parts of the world and the water removed is not replaced → causes droughts

Image Source:
https://ndla.no/subject:cccdda20-f034-4fc7-877a-f91d89c40178/topic:9e6c9f83-32a1-4cb4-977a-7a780c4948a3/resource:ba1392df-2d7f-4e38-9969-a1284c82466a?filters=urn:filter:c8d6ed8b-d376-4c7b-b73a-3a1d48c3a357

What causes drinking water to be contaminated?

Three types of contaminants:

- biological
- chemical
- physical

Teacher Notes:
Contaminants are the contents in our water that can harm humans, animals and the environment. Not everything that water contains is harmful.
3 main reasons that may make our water unsafe:
1. There may be harmful bacteria or viruses in the water. For example, E. Coli is a type of bacteria that can make people very sick.
2. Toxic chemicals from pesticides, road salt, industrial waste or oil spills dissolve into the water.
3. Physical materials like litter, animal waste and plant debris are substances that enter our water systems, but do not dissolve. Dirt often provides a place for harmful organisms to hide.

Image Source:
https://waterfilteranswers.com/usa-water-pollution/

Water Scarcity

Clean drinking water is necessary for life!

A lack of clean water results in:

- poverty
- disease
- death

Teacher Notes:
- of the 1% of freshwater on Earth, most of it is found in North America!
- that means that 785 million people lack access to safe water
- 2 billion people lack access to water for sanitation
- 1 million people die each year from water, sanitation or hygiene-related diseases
- nearly all of these deaths occur in the developing world
- with older students - project an image of a Water Scarcity World Map and discuss → compare this with a global map of each of the following 3Ls: life expectancy, living standards and literacy rates → what connections can you make between the maps? Have students research the the impact of freshwater access on the 3Ls.

Facts Source:

http://water.org/water-crisis/water-facts/water/

Image Source:

https://commons.wikimedia.org/wiki/File:Providing_clean_water_to_millions_of_people.jpg

What Can We Do?

We can change our habits to conserve more water.

Image Source:
https://www.waterpik.com/shower-head/blog/images/ways-to-save-water-at-home.jpg

Human Activities Affect Our Water Supply

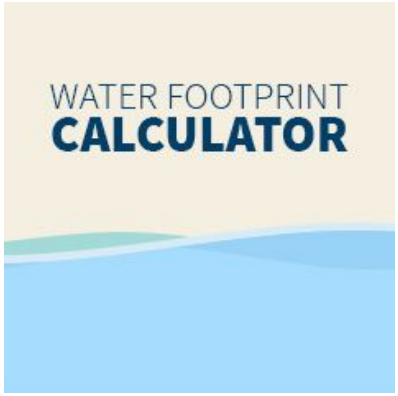
Positive Human Impact:

- be aware of your habits
- find ways to conserve water
- dispose of substances properly
- stewardship
- take action locally and/or globally

Teacher Notes:
Don't take our freshwater for granted! We do not have an unlimited supply! There are many simple changes that we can make to help conserve and sustain our freshwater sources.

Image Source:
https://commons.wikimedia.org/wiki/File:Taking_care_of_the_water_-_water_conservation_icon.png

What's Your Water Footprint?



Have students work with their families to calculate their water footprint: https://www.watercalculator.org/
Have students reflect on their results with their family. What water conservation strategies can they apply to their everyday life? Ask students to be ready to share next class.

Image Source:
https://wall.alphacoders.com/big.php?i=437400

Be Water Wise!

Be mindful of your water use and change your habits.

- take shorter showers
- turn off the tap
- use water efficient machines and devices
- drink tap water and take your reusable water bottle with you

What else can you do at home?

Teacher Notes:
Protect our future supply of water by taking action!
Some things you could do at home: take shorter showers, turn off the water while you lather up, use cold water to brush your teeth, don't let the water run when it is not in use, use a low-flow shower head and/or toilet, use a reusable water bottle and fill it up at home before heading out the door, avoid watering your lawn every day, use the rainfall collected in a rain barrel to water your garden, save and use grey water, etc…
→ students will be able to share more tips after calculating their water footprint - the site provides a lot of useful tips and also addresses the water we don't "see" (i.e., the amount of water used to produce a t-shirt or hamburger)
- Optional Activities - create a poster using the ideas discussed and place it where others can see or use sidewalk chalk to draw a message for passersby!

Image Source:
https://stock.adobe.com/ca/images/outline-save-water-vector-icon-isolated-black-simple-line-element-illustration-from-ecology-concept-editable-vector-stroke-save-water-icon-on-white-background/260394674

Proper Disposal of Substances

You can avoid contaminating our water bodies by disposing your household hazardous items properly!

Research your local recycling and waste depots to learn more.

Teacher Notes:
People often throw old medicines down the drain or flush them in the toilet. These end up in our water bodies and effect the ecosystem. You can quickly search your city's local waste services to find out where you can dispose of household hazardous waste like old batteries, paint, oils, medications, etc… Many cities have an app or website that will help to answer your questions, like the Waste Wizard in the city of Toronto.

Image Source:
https://pixabay.com/illustrations/search/paint%20cans/

Stewardship Opportunities

Be a changemaker!

- help plant trees
- plant native species in your garden
- grow native aquatic plants and place them in a local wetland (check with local conservation authorities)
- help clean local water bodies

Teacher Notes:
Did you know that plants that are native to our land are more hearty and require less water? By planting a native plant garden, you are helping pollinators, the environment and water systems! Wetlands help to filter and clean our freshwater sources. Contact your local conservation authority to see how you can help with restoring local wetlands. Participate in local cleanups to prevent litter from entering our water systems. Look out for local events near you and do your part!

Image Source:
https://commons.wikimedia.org/wiki/File:Plant_tree.png

Think Globally, Act Locally!

Be a global citizen!

- your actions help to reduce climate change and impact people around the world
- raise awareness about local and global issues surrounding water
- join local environmental events
- volunteer with various environmental organizations

Teacher Notes:
There is a lot that you can do to create change. Whether it is raising awareness about the fracking industries near First Nations reserves, or about the boiled water advisories and their impact on Indigenous communities, you can make a difference. In what other ways can you be an agent of change?

Image Source:
https://www.waterpik.com/shower-head/blog/images/ways-to-save-water-at-home.jpg

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Farahnaz Wadia

Farahnaz is a grade 7/8 teacher in Toronto, Ontario, Canada. She is passionate about environmental education and believes in the importance of providing students with opportunities to lead and create change as advocates and stewards for our Earth. In 2015, Farahnaz's class proudly accepted the RBC-Evergreen Watershed Champions Award for their inquiry on a local water system.