Water Issues

Water is vital to our existence. We need water to produce the food we eat, the clothes we wear or even the cell phones we use.

Did you know?

- Each human consumes as much as 3000 - 6000 l of water a day. Globally that is an annual world water consumption of 4 trillion cubic meters. (https://www.theworldcounts.com/stories/average-daily-water-usage).
- Our planet is a water world, but only 2.5 % of that water is drinkable.

This raises the question of whether our planet's dwindling water resources can support our current water usage, not forgetting that our population continues to grow and alongside it the demand for resources.

So where is our water going?

Agriculture is still the biggest consumer of water. It takes huge amounts of water to get your food to your fork.

Did you know?

- A kilogram of beef needs 15 500l to produce?!
- A kilogram of chocolate needs even more - a whopping 24 000l of water.

We use the term **indirect water use** to describe water which is used to produce everything we need to survive. We refer to the amount of water each item needs as it's water footprint

The following resources provide some scary information of how much water is needed to produce common food items.

- https://waterfootprint.org/en/water-footprint/product-water-footprint/water-footprint-crop-and-animal-products/

- https://foodprint.org/issues/the-water-footprint-of-food/

We need to consider this virtual water when we talk about reducing our water use.

A useful method to examine our whole water usage is a water footprint. A water footprint gives us an indicator of the amount of water in litres that is used throughout the entire production chain on an item.

The concept of water footprint was conceived by Arjen Hoekstra in 2002, with the aim of creating awareness about the water cost of our lifestyles.

Learners can calculate their individual water footprints using the online calculator found at: https://www.watercalculator.org/.

The water footprint is created for use in America, so learners will have to convert gallons to litres. 1 gallon = 3.7854l

https://waterfootprint.org/en/resources/interactive-tools/personal-water-footprint-calculator/personal-calculator-extended/

This water footprint is less detailed but can be based in other countries.

What can we do?

We need to be conscious consumers and focus our diets on ingredients that use less water.

Simple ideas:

1. Eat less meat. If you choose to eat meat, choose meat that is grass fed.
2. Investigate your favourite product to see if the manufacturer employs water saving farming and production methods.
3. Learn to identify water intensive products (like almonds) and use them sparingly.
4. Stop buying new clothes, instead shop second hand, swap with family and friends and look after your current clothing to ensure it lasts.

5. Buy reusable products.
6. Ride a bike. Fuel requires water.
7. Reduce your dependence on plastics.

- https://www.pelicanwater.com/education/virtual-water-conservation-guide/#:~:text=Cut%20out%20plastic.,that%20negatively%20impacts%20the%20environment.
- https://blogs.rochester.edu/thegreendandelion/2022/01/reducing-your-virtual-water-footprint/

Additional Resources

- https://iwaponline.com/wp/article/20/1/37/38138/Spatial-inequality-in-water-access-and-water-use
- https://www.wri.org/insights/water-can-exacerbate-inequality-or-it-can-help-solve-it

Lesson Plan Ideas

Start your lesson plan with a discussion with learners about their own personal water usage. Most should have a good idea of direct water use - drinking, bathing etc. From this point you can move onto the invisible water that we use in our everyday lives to produce food, clothing etc.

Some useful videos to show the class:

- https://www.youtube.com/watch?v=az7Lrdq66mM (uses gallons)
- https://www.youtube.com/watch?v=IeMCjpdmcNE (uses gallons)
- https://www.youtube.com/watch?v=0_bUzH6T6zU

Each grade can then follow the worksheet instructions, under educator supervision.

Activities and Curriculum Links

Invisible Water Usage	
Grade	3 - 4
Subjects	Natural Science, mathematics, and Life Skills
	The learners will gain a basic understanding of the water footprint of common food items, using a sandwich as an example. This is an individual or group activity. The learners will work out the water footprint of a sandwich they have created, using pictographs.
Duration	30 - 45 minutes.
Resources	Worksheets, recycled bottles (e.g., coke, milk, and water) give the learners a visible representation of a litre

Personal Water Footprints	
Grade	5 - 6
Subjects	Life Skills/ Mathematics
	The learners will work out their own personal water footprint online and reflect on ways to reduce their water usage. This is an individual activity.
Duration	30 minutes
Resources	Internet access, worksheets

Water Friendly Restaurant	
Grade	7 - 9
Subjects	Natural Science, English, Mathematics, Art, and Technology
	The learners will design and make their own water environmentally friendly restaurant menus using water footprints of ingredients as a guide. They will be required to work out the water cost of an item and it will impact their menu design. This is a group activity.
Duration	3 x 45 minutes
Resources	Worksheets, calculators, cardboard, art supplies

Issues Around Water	
Grade	10
Subjects	Thematics (History, Geography), English, Life Orientation
	The learners will research and summarise articles of water usage, related to historical and geographical inequality and how this relates to water saving. Once summarised, information will be presented to the class.
Duration	45 minutes
Resources	Internet access
Lesson Extension	Debate individual responsibility of reducing water use (people in poverty/farmers/miners/consumers etc.)

Cross-curricular activities:

Art
1. Design posters to educate the water footprint of common food items. Think of how to cleverly display the information, to generate the biggest impact.

Thematics
1. Look into ancient farming methods and compare them to current agricultural methods, list the pros and cons.

Life Orientation
1. Embrace “Meat Free Monday” at your school. Have a cooking competition to see who can create the most delicious, environmentally friendly meal. Engage with local farmers to try and understand water conserving-farming techniques.

Technology
1. There are a variety of resources of new technology in agriculture. • https://eos.com/blog/top-5-newest-technologies-in-agriculture/ • https://www.plugandplaytechcenter.com/resources/new-agriculture-technology-modern-farming/ • https://www.croptracker.com/blog/10-emerging-innovations-in-agtech.html • https://www.futurefarming.com/smart-farming/how-can-small-farmers-adopt-new-technology/