



# Green Home 'Water Wise Challenge'



Household Surname: \_\_\_\_\_

School Name: \_\_\_\_\_

**'Oil peak: there are alternatives, water peak: there are NONE'** (Hoard, 2007).

Ireland is an island with over 220 million acres of marine territory, our largest natural resource – a national asset for food production, transport, tourism and the generation of sustainable energy.

**By participating in the Green home 'Water Wise Challenge' you will learn about ways to conserve and preserve water.**

Wk 1: Discover more about water- 'virtual water'.

Wk 2: Find out about water use in our homes: where does it come from?

Wk 3: Learn about no cost and low cost ways to conserve water at home.

Wk 4: Conduct a household audit on virtual water in tea, coffee and milk.

Wk 5: Reflect on all your hard work to conserve and preserve water

## **Background context on water:**

- When the astronaut Neil Armstrong looked at the earth from the moon in 1969, it looked all blue.
- Water covers over 75% of the Earth's surface; it is without doubt the most valuable of all the Earth's natural resources.
- In 2016 there are nearly 7.5 billion people in the world.
- The world is gaining 1 billion people every 11 years.
- The consumption of water is doubling every 20 years – more than twice the population.

## Week one: water usage, status and quality

### **Importance of conserving water:**

About one third of the world's approx 7.5 billion people already live in countries considered to be 'water stressed' - that is, where consumption exceeds 10% of total supply. If present trends continue, two out of every three people on Earth will live in that condition by 2025.



Although water shortages are a rare occurrence in Ireland to date, increased demand coupled with the impacts of climate change are likely to result in shortages in the coming years. Urban centres such as Dublin, Galway, Athlone and Letterkenny face issues with water shortages.

A number of European Union Countries charge the domestic sector for the water they use. Water in Ireland is free to domestic users, and water usage here at about 160 litres per person per day is above the European average. As Ireland's population grows over the coming years water conservation will become increasingly important.

Water is important for biodiversity; biodiversity is lost as a result of pollution of water as associated with human activities including inadequate wastewater treatment and poor agricultural practices. It is envisaged that households in Ireland will pay for the water they use in the coming years in line with the European Union's *Polluter Pays* principle.

### **Did you know?!**

The oceans hold 97% of the world's water. 2% is frozen in the polar ice caps. The remaining 1% not only provides all the water in the atmosphere and all the groundwater, lakes and rivers. We depend on the Water Cycle to recycle this 1% to meet all our needs.

## The Water Cycle

The water cycle is the process by which involves the continuous movement of water on, above and below the surface of the Earth. It provides a continuous supply of fresh water in the environment and consists of 5 main processes:

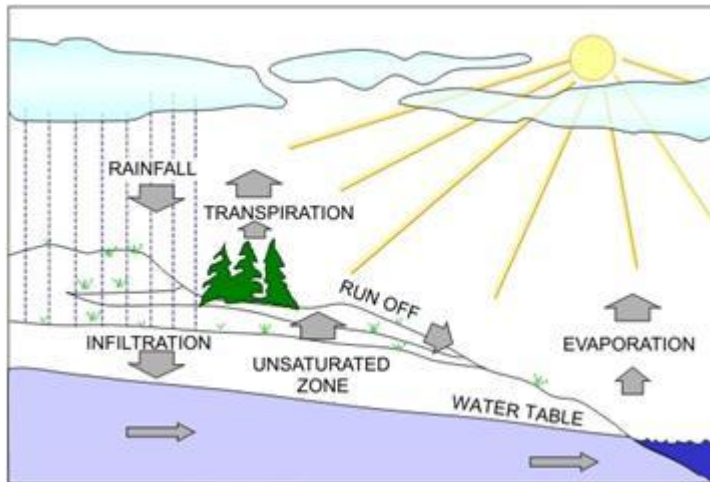


Figure 1: The Water Cycle

- 1) **Evaporation** - water is heated and changes from liquid to gas (water vapour).
- 2) **Condensation** - vapour rises and condenses into tiny droplets to form clouds.
- 3) **Precipitation** - clouds become too heavy and cause rain to fall.
- 4) **Absorption** - the earth absorbs the water.
- 5) **Runoff** – when the ground has absorbed water to full capacity, excess water from rain, hail etc. flows over land and eventually flows into streams, rivers, lakes and makes its way back to the sea.

## Water: Importance and uses

Biologically and chemically clean pure water is essential for healthy life. Water makes up anywhere between 60 and 70% of the human body and it is essential for basic bodily functions. We require about 2 litres of water per day to maintain adequate hydration, and we can only survive a few days without water. There are a wide variety of beneficial uses of water including drinking and domestic use, uses in industry, agriculture, fishing and recreational uses such as swimming.

Our drinking comes from two sources: from groundwater in the form of underground aquifers and surface water from streams, rivers and lakes.



**Groundwater** is pumped to the earth's surface from wells. This water usually requires little treatment before drinking because it has already been filtered through sand and rock as it settles into the earth.

**Surface water** requires filtration to remove any silt, sand or organic matter collected by the water as it moved from one area to another. Chemicals are added to speed up the process that nature uses to clean water.

### Water Contamination:

Water pollution arises from different sources in different areas. Sources of water pollution in urban areas include outflows from sewage treatment and industrial plants and run-off from roads. In rural areas sources include fertilisers & animal wastes arising from agricultural activity. Groundwater contamination can arise in rural areas as a result inadequate percolation at septic tanks of poorly maintained or constructed septic tanks.

### Did you know?!

In 1889 the UK government invested in sanitation infrastructure and there was a 15 year increase in life expectancy over the next four decades!

## Week two: Learn more about how much water we use in our homes

Did you know that Ireland is the only country in the European Union that does not pay for the amount of water used in the home?

Where does your drinking water come from?

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Where is the nearest waste water treatment plant to where you live?

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(Hint: your local authority or local library may help you with these questions)

### **Find the leaking tap in your school and your home:**

- 30 drops per hour = 1008 gallons per year
- 60 drops per hour = 2016 gallons per year
- 90 drops per hour = 3036 gallons per year
- 120 drops per hour = 4044 gallons per year



### **Did you know?!**

Bottled water should not be considered a sustainable alternative to tap water, as it is not exempt from occasional contamination. Tap water is more energy-efficient as it is provided through underground pipes, compared to the fuel and energy needed for filling bottles and transport.

**Table 1: Approximate water usage in the home**

Activity	Litres Used	Room in House
Bath	80 litres	Bathroom
5 Minute Shower	35 litres	Bathroom
Power Shower	125 litres in less than 5 minutes	Bathroom
Brushing Teeth with Tap running	6 litres per minute	Bathroom
Brushing Teeth with Tap off	1 litre	Bathroom
W.C. Flush standard	9 litres	Bathroom
W.C. Flush modern	6 litres	Bathroom
Washing machine modern	45 litres	Kitchen
Washing machine	65 litres	Kitchen
Dishwasher	20 litres	Kitchen
Washing car with Bucket	10 litres	Outdoors
Hosepipe	9 litres per minute	Outdoors

**Did you know?!**

A regular shower will use about 35 litres of water in 5 mins. But be aware a power shower will use over 125 litres in the same time.



**Week three: Learn about no cost ways to conserve water at home**

## General Tips:

- Reduce your water consumption by changing your water-use habits. Check out some ideas in the Kitchen, Bathroom and Outdoors links
- Make sure to turn taps off properly.
- Repair leaky plumbing fixtures, such as taps and toilets. A dripping tap can waste 30 - 200 litres a day, while a continuously dribbling tap can waste up to 600 litres per day.
- Retrofit your home with more efficient water-using fixtures and products- how about a 'hippo bag' for your toilet cistern- this can save 3 litres of water per flush.
- Fit eco-shower heads in the bathroom and save up to 60% of the water used, which means you save money also as you use less hot water.
- Fit aerators or flow-control valves onto your taps. Standard taps can run up to 15 – 20 litres a minute. Aerated taps can reduce water flow by up to 80%, they cause less splashing and the water supplied is still as effective for washing.
- Rainwater can be collected and used instead of tap water.
- Recycle your grey water: water butts.
- Use environmentally safe cleaning products to reduce the impact of chemicals on our waters.
- Don't pour paint, antifreeze or other chemicals down a drain – dispose of unwanted chemicals, solvents and oils responsibly.



## Hippo Bags & Save-a-Flush Bag

Hippo bags are a simple and proven water saving device to help conserve water in toilet cisterns.



Installing a Hippo couldn't be easier and will save up to three litres of water per flush.

Simply place the device in the water underneath your cistern float. When the toilet is flushed, the water confined within the Hippo's polyethylene bag is saved.

Hippo bags should only be used in toilet cisterns with a 9 litre flush or greater (usually pre-1993).

If you have a toilet cistern with a 7-9 litre flush (usually installed 1993-1999), you should use a Save-a-Flush bag. These typically save 1 litre per flush.



Dual flush and slim-line toilets are already water efficient and do not need any type of cistern device.

For more tips and ways to conserve and save water see:

<http://taptips.ie/downloads/HowMuchWater.pdf>

### Did you know?!

Water use contributes to your carbon footprint because energy is needed to treat water to enable us to drink it and energy is required to treat the waste water from our schools and households.



## Conserving water in the garden

A water butt is a barrel-like tank used for collecting rainwater from your roof's drainpipes after rain. This water can then be used for watering plants in your garden.

### How a water butt works

A water butt can be connected to a downpipe so that it collects rainwater from your gutters. If you are using a downpipe, you will also need an overflow pipe or a rain diverter to redirect water into the butt. Once it's full, water flows down the drainpipe. A gutter filter will also keep out unwanted debris. To fit a diverter or an overflow pipe, your butt will need a hole in the side, and to fit it directly to a downpipe it will need a hole in the lid. Butts either already have these holes provided or have a guide as to where to cut a hole.



### Tips on fitting a water butt

- Install the water butt only on a firm, flat surface that is strong enough to carry the weight when filled with water
- Empty the water butt when there is a risk of freezing
- If the water butt is accessible by children, secure the lid to the barrel
- If necessary, drill the hole for the tap only at the marked location
- Consider a water butt stand allowing the water to be dispensed directly into a watering can

## Virtual water, what is it?

Virtual water is the water 'embedded' in commodities. Producing goods and services requires water; the water used to produce agricultural or industrial products is called the virtual water of the product.

The global volume of virtual water flows related to the international trade in commodities is 1,600 Km<sup>3</sup>/yr. About 80% of these virtual water flows relate to the trade in agricultural products, while the remainder is related to industrial product trade.



The production of 1 Kg of **rice** requires 3,000 litres of water

The production of 1 Kg of **maize** requires 900 litres of water

The production of 1 Kg of **wheat** requires 1,350 litres of water

The production of 1 Kg of **beef** requires 16,000 litres of water.



Compare water we use with virtual water embedded in food. For example one burger bun is equal to 30 baths. Look at our water use within the context of both direct and indirect water uses to produce all the goods and services consumed by an individual, a community or even a school determines your water footprint. See [www.waterfootprint.org](http://www.waterfootprint.org).

### Did you know?!

140 litres of water are needed to produce 1 cup of coffee and 35 litres per cup of tea while the production of 1 litre of milk requires 1,000 litres of water.

## Week Four: Virtual Water Audit



For this activity we would like you to add up (approximately) the number of cups tea/coffee and the number of litres of milk in one week. Nominate one household member to keep a record.



1 cup of coffee = 140 litres of 'virtual water'

1 cup of tea = 35 litres of 'virtual water'

1 litre of milk = 1,000 litres of 'virtual water'

Cups of Tea/ Coffee Per day	Quantity per day coffee	Quantity per day Tea	Virtual Water
Monday			
Tuesday			
Wednesday			
Thursday			
Friday			
Saturday			
Sunday			
<b>Total for week</b>			

Litres of Milk	Litres per day	Virtual Water
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		
<b>Total for week</b>		

**Week Five: Reflect on all you have done to conserve water in the home**

**Water in the Kitchen**

Can you list two ways to save water in the kitchen?

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**Water in the bathroom**

Can you list two ways to save water in the bathroom?

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**Water outside**

Can you list two ways to use less water outside in the garden?

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**Did you learn anything new?**

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