

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

**Water in the Kitchen**

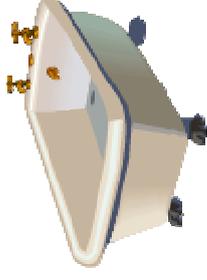
Can you list two ways to save water in the kitchen?

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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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# Green Home 'Water Wise Challenge'



Ireland is an island with over 220 million acres of marine territory; it is our largest natural resource and is extremely important for food production, transport, tourism, and as a renewable energy source.

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

Wk 1: Discover more about water – water is very important!

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 and it is without doubt the most valuable of all the Earth's natural resources. In 2009 there are 6,800,000,000 (6.8 billion) people in the world with 80,000,000 (80 million) people added each year. Worldwide, the usage of water is doubling every 20 years – more than twice the rate of population growth.

## Week one: water usage, status and quality

### Importance of conserving water:

About one third of the world's population already lives in countries considered to be 'water stressed' - that is, where water supply falls short of demand. If present trends continue, two out of every three people on Earth will live in that condition by 2025.



Although water shortages are rare in Ireland to date, increased demands along with the impacts of climate change are likely to result in shortages in the coming years. Researchers recently predicted that cities and large towns such as Dublin, Galway, Athlone and Letterkenny may experience water shortages within the next five years.

A number of European Union Countries charge people for the water they use at home. Water in Ireland is currently free to householders, 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 wildlife, which is endangered as a result of water pollution. Water pollution is caused by human activities such as ineffective water treatment and poor farming practices. In the future, it is likely that households in Ireland will pay for the water they use, as in other European countries.

### Did you know!

The oceans hold 97% of the world's water? 2% is frozen in the polar ice caps. The remaining 1% 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 (see next page).

## Week Four: Virtual Water Audit



For this activity we would like you to estimate or guess how many cups of tea/coffee and litres of milk consumed in your house in one week. Nominate one household member to keep a record.



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

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

Cups of Tea/Coffee	Quantity per day	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>		

## Virtual water, what is it?

Producing goods and services requires water. The water used to produce agricultural or industrial products is called the virtual water of the product. This virtual water is not visible in the product when it reaches you, but it is used in the long process of making it and getting it to you. We say that the virtual water is 'embedded' (contained in the making) of these products.



The amount of water used around the whole world in the international trade of everyday products is incredibly large. About 80% of this 'virtual water' is result from the production of food, while the rest is used in industrial production.

- 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.



Our water footprint is a measure of the amount of water that we use both directly and indirectly everyday. In Week two we estimated the amount of water you use directly everyday. Working out the total amount of water we use indirectly (i.e. the virtual water used in the products we purchase) can be more difficult. In Week 4 we will look at the amount of virtual water contained in the milk, tea and coffee we consume every week.

To find out more about virtual water visit [www.waterfootprint.org](http://www.waterfootprint.org)

**Did you know:** 140 litres of water are needed to produce 1 cup of coffee/tea while the production of 1 litre of milk requires 1,000 litres of water?

## The Water Cycle

The earth has a limited amount of water which is continually being recycled. Water from rivers, lakes, and the oceans are heated by the sun, turning it into water vapour (or steam). This water vapour leaves the river, lake or ocean and goes up into the air. Some water is also released from plants, which 'sweat-out' water through their leaves. This process is known as transpiration.

As water vapour rises it gets cold and turns into clouds, this is called condensation. When the clouds become too heavy, they fall as rain, sleet or snow. This is called precipitation.

Some of the water falling on the land flows into streams and rivers, the rest soaks into the ground where it joins underground streams. All the water in the streams and rivers and under the ground eventually flow back into the sea, where the cycle starts all over again.

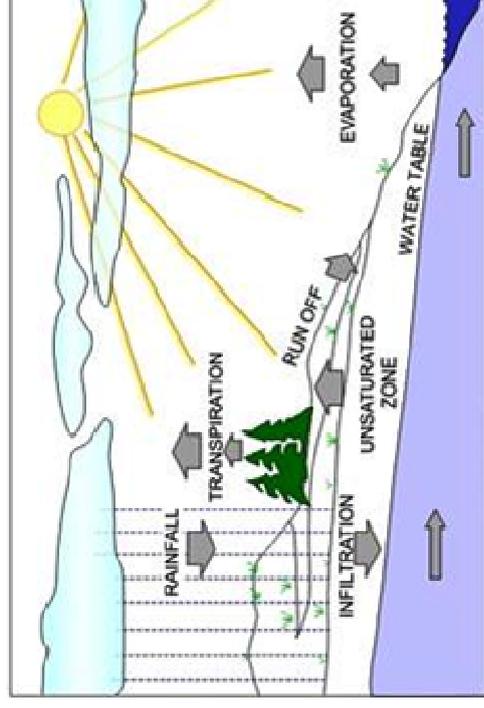


Figure 1: The Water Cycle

## Water: Importance and uses

Clean pure water is essential for all life on earth. Water also makes up between 60 and 70% of the human body. We need about 2 litres of water per day to stay healthy and we can only survive a few days without water.

People use water in many ways: we drink it; wash with it; use it in our gardens; fish and swim in it; cook with it; clean our homes; dishes and clothes with it. Our drinking water comes from two sources: from groundwater in the form of underground springs and surface water from streams, rivers and lakes.



Groundwater is pumped up 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 needs to be treated to remove any material that would make it unsuitable for use.

## Water Pollution:

Contamination due to human activities has resulted in a decline in Ireland's water quality over the last thirty years. Water pollution arises from different sources in different areas. Water pollution in cities and towns comes from waste water from sewage treatment and industrial plants and run-off from roads. In country areas sources include fertilisers and animal wastes arising from farm activity. Groundwater contamination can also arise in rural areas as a result of inadequate percolation at septic tanks of poorly maintained or constructed septic tanks. This means that not all of the pollution in the water is removed before it is allowed back into the world.

**Did you know!** In 1889 the UK government invested in sanitation infrastructure (hygiene system) and there was a 15 year increase in life expectancy over the next four decades!

## 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 things like watering plants in your garden or washing your car.



## Rainwater harvesting

A water butt can be connected to a downpipe (the pipe that runs from the ground up to your drainpipes) so that it collects rainwater from your gutters. If you are using one of these downpipes, you will also need an overflow pipe or a rain diverter to redirect water into the butt. Once it is full, water flows down the drainpipe. A gutter filter will also keep out unwanted debris or rubbish. 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. This is also a good way to keep out unwanted debris, rubbish or insect eggs.
- Drill the hole for the tap only at the marked location
- Consider using a water butt stand allowing the water to be poured directly into a watering can
- Water butts are available from your local authority for around €40. Check out your local garden centre or even design your own!



### Hippo bag Instructions

Hippo bags are a simple and proven water saving device to help conserve water in toilet cisterns. (Cisterns are the tanks of water attached to toilets which allow them to flush.)



Installing a Hippo couldn't be easier and will save up to 3 litres of water per flush.

Simply place the device in the water underneath your cistern float. When the toilet is flushed, the water in the Hippo's 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 slimline toilets are already water efficient and do not need any type of cistern device.

For more details on getting hippo bags contact the environment department in the local authority in your area.

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

<http://www.taptips.ie>

**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?

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

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

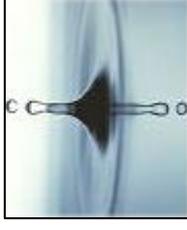
Where does your drinking water come from?



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



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(Hint: the water department at your local authority 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 sometimes contaminated or impure? 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
Bath	80 litres
5 Minute Shower	35 litres
Power Shower	125 litres in less than 5 minutes
Brushing Teeth with Tap running	6 litres per minute
Brushing Teeth with Tap off	1 litre
Toilet Flush standard	9 litres
Toilet Flush modern	6 litres
Washing machine modern	45 litres
Washing machine	65 litres
Dishwasher	20 litres
Washing car with Bucket	10 litres
Hosepipe	9 litres per minute



**Did you know!**

A regular shower will use about 35 litres of water in 5 minutes. But be aware a power shower will use over 125 litres in the same time. A bath uses more than double the water of a regular shower.

**Week three: Learn about no cost and low 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.
- Placing a 'hippo bag' in your toilet cistern- this can save up to 3 litres of water per flush.
- Fit eco-shower heads in the bathroom and save up to 50% of the water used, which means you save money also as you use less energy in heating 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 50%, they cause less splashing and the water supplied is still as effective for washing.
- Rainwater can be used instead of tap water, by using a water butt to collect water from drainpipes.
- Recycle your grey water: eg use basin from washing up to clean the floor



- Use environmentally safe cleaning products to reduce the impact of chemicals on our waters. Things such as lemon and vinegar are great cleaning products that can be found in the home and are cheap to use.
- Don't pour paint, antifreeze or other chemicals down a drain – dispose of unwanted chemicals, solvents and oils responsibly.