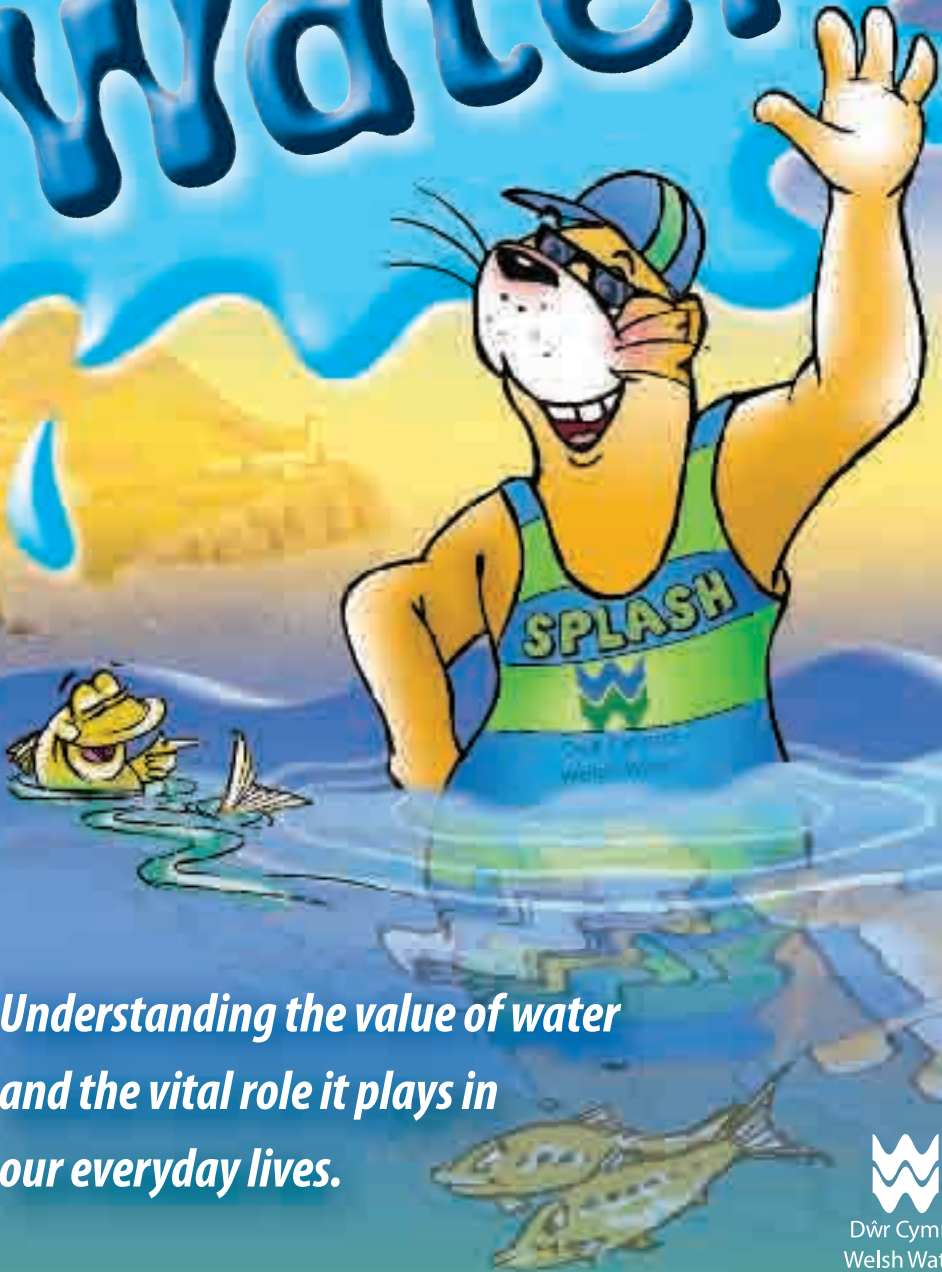


all about

Water



*Understanding the value of water
and the vital role it plays in
our everyday lives.*



Dŵr Cymru
Welsh Water

How the Water cycle works



1 Evaporation

2 Condensation

3 Precipitation



5 Transpiration

4 River

1 Evaporation

The Sun's heat turns water into an invisible gas called water vapour which rises into the air.

2 Condensation

Clouds are formed when water vapour cools and turns back into tiny water droplets.

3 Precipitation

When the water droplets grow larger and heavier they fall back to Earth as rain, hail, sleet or snow.

4 River

Water flows from the land to the sea through streams and rivers and lets the water cycle continue.

5 Transpiration

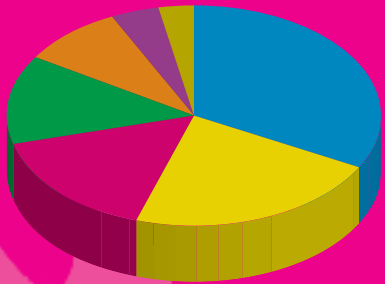
Plants take in water through their roots and get rid of excess water through their leaves.

Because of the way the water cycle works, there is no new water on the planet. We are drinking the same water as the dinosaurs!

Use what you need, but don't waste it

Dŵr Cymru Welsh Water is a 'not for profit' organisation, that delivers over 8 billion litres of clean drinking water every day to its 1.3 million customers. On average that's 150 litres per person per day, 15 buckets full in 24 hours!

How your water is used in the home



In a typical home

■	33% flushing the toilet
■	22% using the washing machine and dishwasher
■	16% using the kitchen sink
■	13% taking a bath
■	9% using the handbasin
■	4% taking a shower
■	3% using the outside tap

Watery Facts

- 97% of the world's water is salty sea water. Of the remaining 3%, most of that is trapped in the ice caps and in glaciers. Only 0.001% is actually available for us to use as fresh drinking water.
- Your body is 2/3 water, make sure you get enough water every day to keep your body healthy.
- It's not just tap water we look after but also the water along our coasts. In 2008 Wales had around 1/3 of the UK's blue flags 47 altogether.
- Being Water Efficient can also mean being Energy efficient. Using less water, will often mean using less electricity.
- 1/3 of the water piped into your home is flushed down the toilet.
- Over 82% of your blood is made up of water
- 72% of your brain is made up of water

How can you save water?

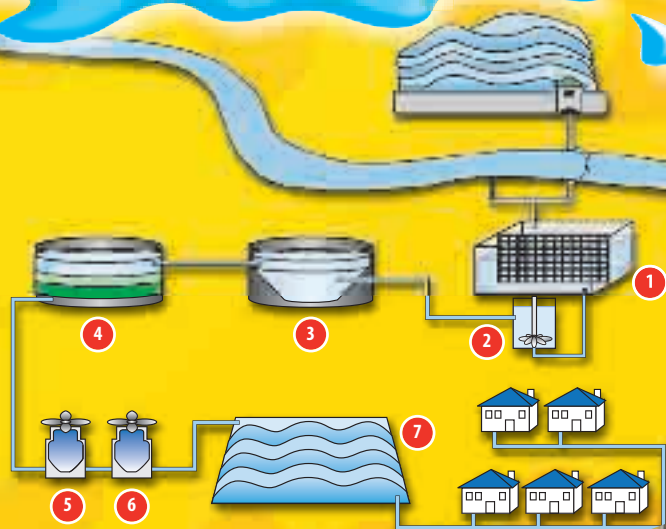
- Don't leave the tap running when brushing your teeth, you could be wasting as much as 18 litres.
- Always fill the kettle with just the amount you need.
- Use a watering can rather than a hosepipe. Why not collect rainwater in a water butt to water your plants during dry spells
- Use a shower rather than a bath. A bath uses 80 litres ...but remember a power shower can use twice as much water as a bath.
- Putting a water saving device, such as a hippo bag in the toilet cistern may help to reduce the amount of water used when you flush by 2 - 3 litres of water
- Don't use a garden sprinkler, as a sprinkler uses as much water in 2 hours as a family uses in 2 days!

More facts:

- Did you know some trees soak up a lot of water every day, an oak can collect as much as 1,200 litres every day through its roots. Having more trees can help prevent flooding and soil erosion.
- Don't FOG the sewers. Fat, Oil and Grease that goes down your drains can clog up the sewers. This can cause them to overflow when there's lots of rain.
- Stay safe around water, don't swim in reservoirs, use the local swimming baths. If there is no room here can you add it somewhere as it is important.



How we treat water



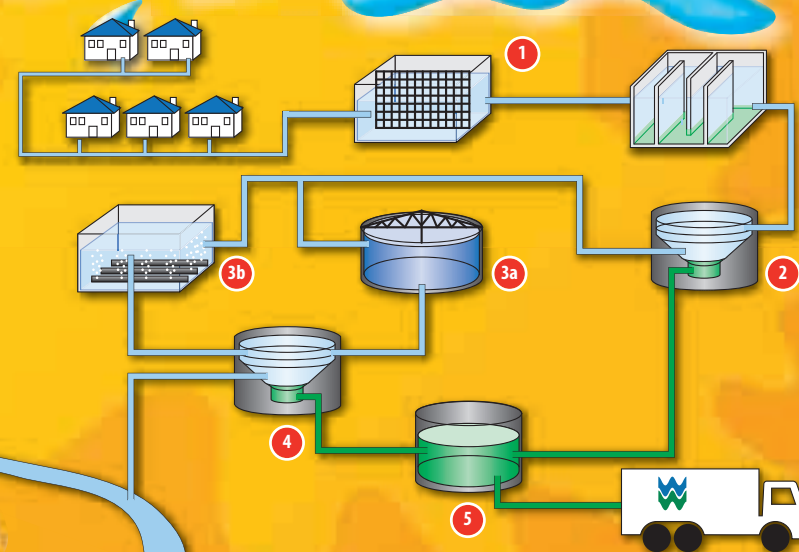
How does that 8 billion litres get to your house? Well, rain water is collected in our 72 reservoirs throughout Wales, and is then taken to one of the 78 treatment works. This process turns the rain into drinking water of the highest standard.

- 1 Screening - water taken from the river or reservoir needs to be screened to remove debris such as leaves, sticks, plastics and fish. This machine is like a large sieve.
- 2 Clarification - The first stage in the cleaning process is known as clarification. Chemicals are added which makes small particles of impurities cling together in clumps which eventually forms a thick sludge. This is separated from the clearer water in a series of settlement tanks. The large particles are removed.
- 3 Filtration - this process is where any remaining small particles are removed using sand and gravel. The water is then taken to the next stage of treatment.

- 4 PH adjustment - the water is treated to make sure it's not too acidic. Too much acid can damage the network of pipes that carries the water to your homes.
- 5 Disinfection - finally chlorine is added to kill any bacteria left in the water.
- 6 Quality control - before it leaves our treatment site the water is tested to make sure it is clean enough to drink and is ready to be pumped through pipes to our customers. There are over 27,400km's of pipes in Wales which delivers your clean drinking water.
- 7 Service Reservoirs - Treated water is then stored in one of the 654 service reservoirs, ready for when you turn on the tap.

This process is closely monitored 24 hours a day, 365 days a year, to make sure our water is good enough for you to drink.

How we treat sewage



Water that leaves your house when you take a bath or flush the toilet is called waste water. This water ends up in a sewer along with rainwater.

The sewer network in Wales is over 19,000 km's long and carries waste water to one of our 833 waste water treatment sites. Treatment works remove grit and heavy particles that may cause harm to the natural environment when it is returned to the river. Waste water is about 99.9% water.

- 1 Screening - water passes through screens which remove heavy particles such as rags, plastics and large objects. This process deals with much of the floating material.
- 2 Primary tanks - fine solid matter, what we call sludge, sinks to the bottom of the tank. Scrapers sweep away the sludge where it is removed and treated.
- 3 Aeration - the water is treated in 1 of 2 methods either through
 - a) Filter beds where waste water is sprayed on a bed of coke, gravel or clinker. Bacteria lives on the surface and as the water passes through this surface

bacteria, fungi and other organisms living on the filter bed will feed on the organic matter in the sewage, turning it into water, carbon dioxide and nitrogen. This water then moves on to the next stage of treatment.

b) Activated sludge is another method of treatment (as per diagram) where air is pumped from the bottom of the tank containing wastewater and bacteria. This keeps the bacteria supplied with oxygen - they multiply and digest the impurities in the sewage.

- 4 Final Treatment - the final settlement process is similar to the primary settlement but the water is now clean enough to be returned to rivers and the sea. On some sites, we use ultra violet treatment to produce an even higher quality effluent.
- 5 Sludge treatment - the sludge left from the cleaning process is collected, treated and is sometimes used by farmers as fertilizer. The rest is disposed of to landfill sites.

Water is cool, respect it!

N D W W N F R C Y R M N R U X
S O W A F O B G E I H O N F Q
C S I O T U I S Y V Z I K M U
Z O N T V E E T J E C T J X N
C U N N A R R T A R F A N B O
R L U D V T K C M R D R W W R
I E E O E O I M N D O I C Y U
Q P I A O N R P D P G P A T T
C R A C N B S H I N U S A F L
T J R T N D M A W C O N O V W
X C C A Q T V C T S E A P F E
I A D Q F F I B J I T R W C L
Z V I K M O T U U O O T P M Q
E Y A H W A K N I R D N E Q N
E W Q Q S S X R L E S B F R G

*Try and find these
words below in
the Word Search.*

CLEAN
CONDENSATION
COOK
DRINK
EVAPORATION
PRECIPITATION
RESERVOIR
RIVER
RUN-OFF
TAP
TRANSPIRATION
WATER

For further information

On visiting one of our Education Centres please contact:-

Cilfynydd Environmental Education Centre,
Cilfynydd Waste Water Treatment Works
Cilfynydd, Rhondda Cynon Taff, CF37 4WX

Telephone: **01443 492720**

Fax: **01443 405694**

Email: education@livingandlearningwithwater.com

