

WATER a valuable resource

- Water is very important. In fact, Earth is the only planet in our solar system that has water available in a liquid form.
- On Earth, every cell of every living thing is made up mostly of water. Water is a part of everything on earth; in fact our bodies are 65% water.
- Put simply, every living thing on this planet – humans, animals, insects, reptiles and plants, relies upon water for life.

The Earth has lots of water, in fact more than 70% of the Earth's surface is water – oceans, lakes, rivers and frozen polar caps. But much of this water is salty and can't be used for drinking or to grow food crops.

Of all the water on Earth, a very small proportion of it is fresh water, in fact only 0.0003% is useable.



You might ask – Are we running out of water?

Well, the answer is no.

There is as much water on earth today as there was millions of years ago. We get most of our fresh water from the sky in the form of rain. Rain helps grow our food and provides us with a ready supply of drinking water.

But what causes rain?

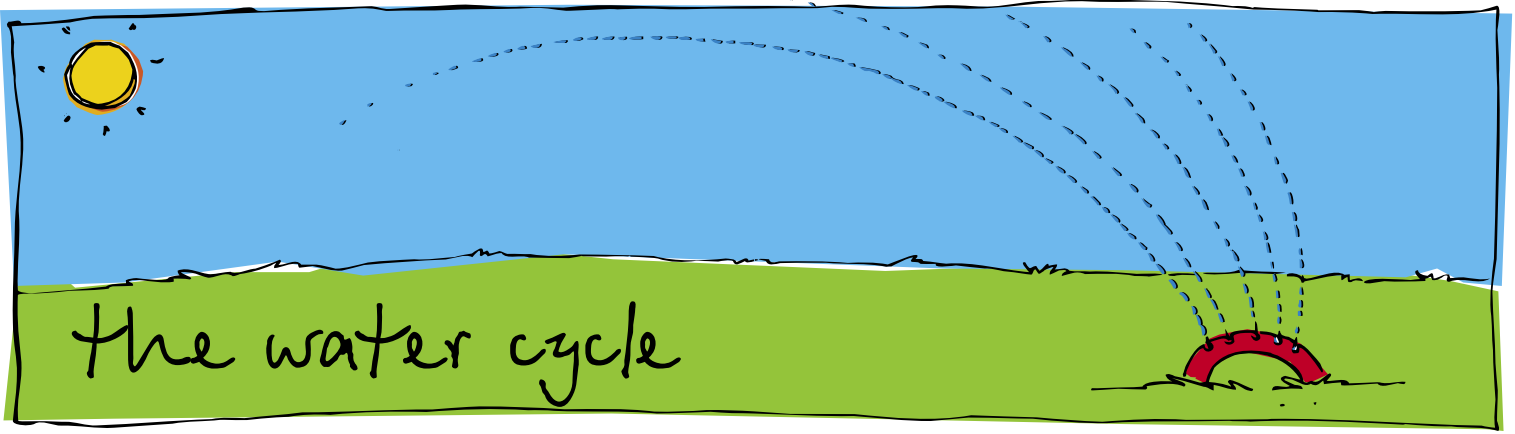
Rain is part of what we call the water cycle.

The Water Cycle

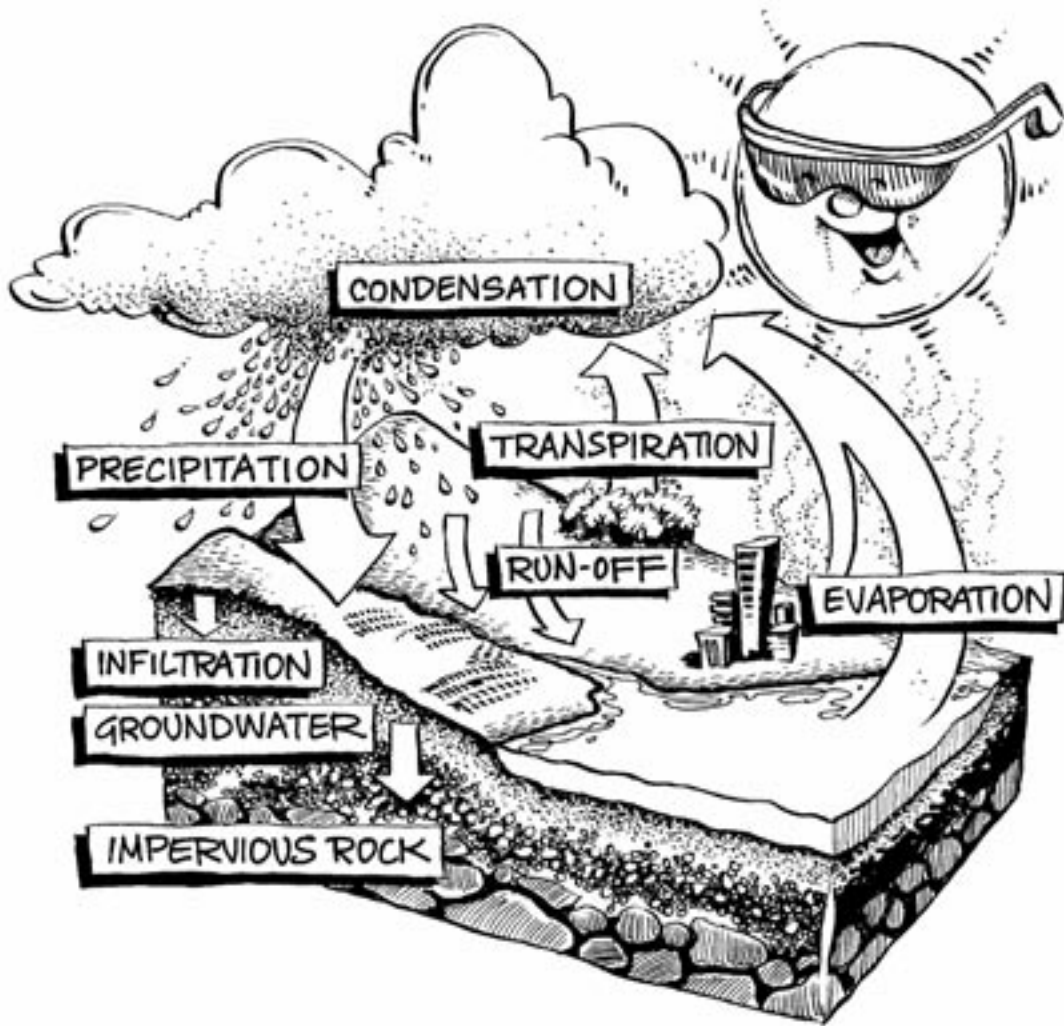
The water cycle consists of 4 parts, evaporation, transpiration, condensation and precipitation.

- Evaporation occurs when the sun's rays draw up water from the oceans, lakes and rivers of the world. We have all seen how, on hot days, water slowly disappears from puddles left on the road after rain or how the water level in the swimming pool goes down. Well, this is evaporation.
- Through their leaves, plants and trees also put water into the atmosphere. This process is known as transpiration.
- All this water is drawn high up in to the atmosphere. Because the temperature up there is much colder, the water vapour cools and forms clouds. This process is called condensation. We have all seen the water vapour coming from the spout of a boiling kettle, well this is another example of condensation.
- When the water moisture in clouds becomes too heavy for the atmosphere to support, it falls back to earth in the form of rain, hail, sleet or snow – this is precipitation.





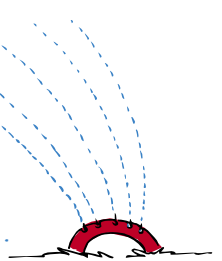
the water cycle

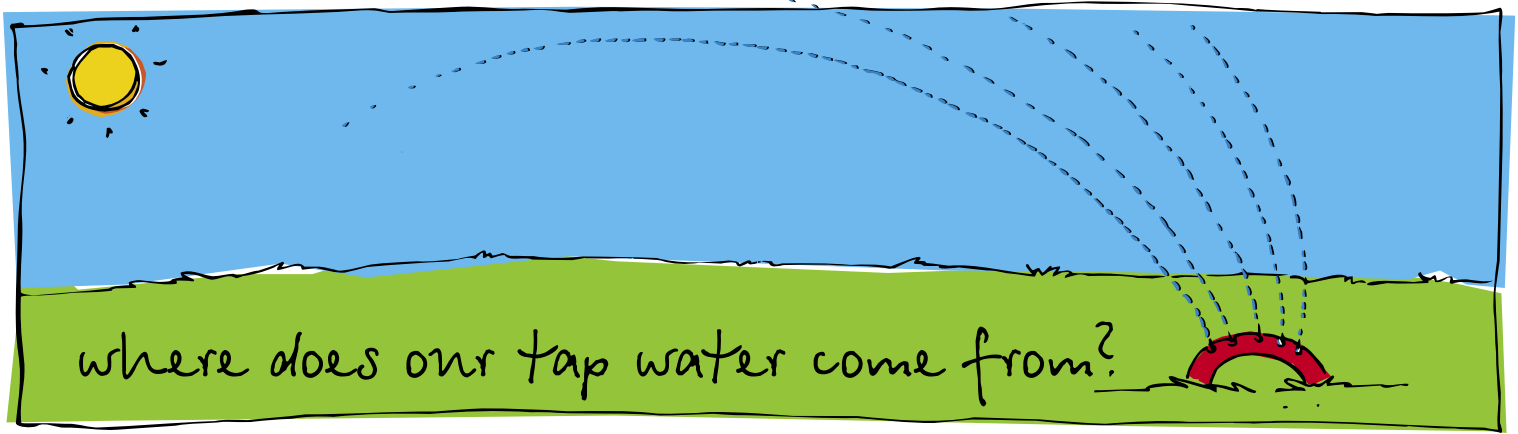


Some of this water soaks into the earth and gathers under the ground in groundwater reserves – this is infiltration. The Great Artesian Basin is one example of infiltration. The rest of the runoff flows down the creeks and rivers back to the ocean where the Water Cycle begins all over again.

So, as you can see, nature has been in the habit of recycling for millions of years.

Now we know all about rain – but where does our tap water come from?





where does our tap water come from?



That is how water gets to our home – but what happens to the wastewater that goes down the sinks, plug-holes and toilets?

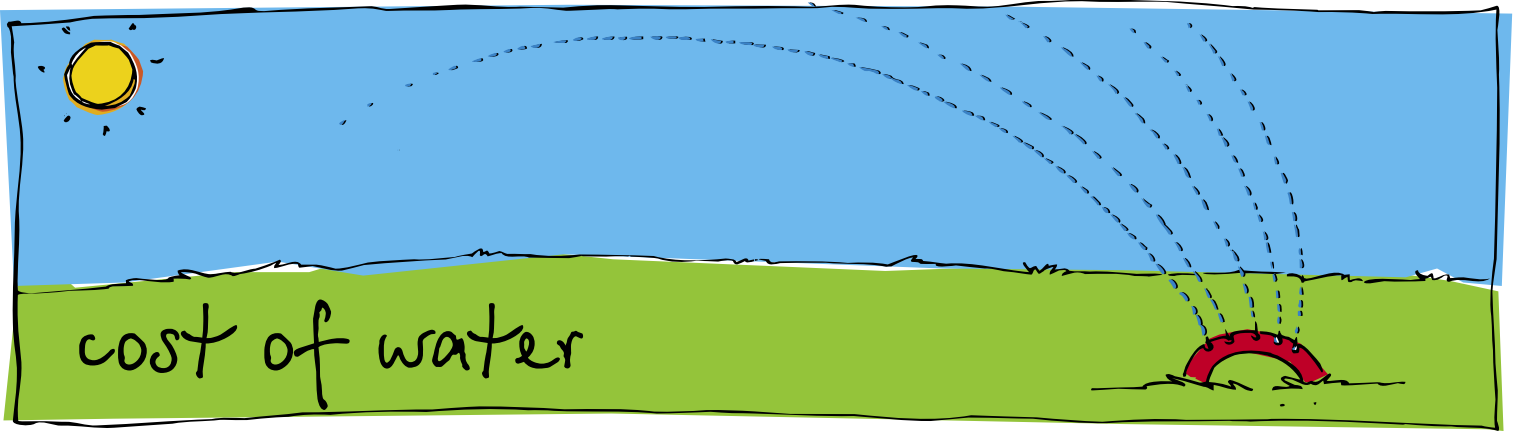
What happens to the water we have already used?

- To supply Hervey Bay with water the Council built a dam across the Burrum River. Lenthalls Dam creates an artificial lake and Council takes water out of this lake and pumps it to a water treatment plant.
- Water is treated or purified to remove harmful bacteria that could make us sick. The purification process makes water safe to drink, to cook with and to wash in. This treated or purified water is then pumped to a storage tank or reservoir.
- The reservoir that supplies water to Hervey Bay is located at Ghost Hill.
- A system of pipes or water mains link these reservoirs to your house. We don't often see these water mains because they are buried under the streets and footpaths of our town. However, sometimes these water mains burst and they need to be repaired.
- So remember, the next time you turn on a tap, the water has come from a dam many kilometres away, travelled along hundreds of kilometres of underground pipelines, been treated to make it safe to drink and pumped to a storage reservoir and then delivered to our homes, schools, and sporting and recreational areas.
- Inside the house water from the shower, bath, kitchen sinks, and washing tubs goes down the plughole. We also use water when we flush the toilet. This used water is known as wastewater.
- Household wastewater, along with wastewater from industry, schools, sporting clubs and places of work is collected and piped to a wastewater or sewage treatment plant. 99% of this waste is water; the rest is made up of grit, grease and solids such as paper, plastics and human waste.
- The sewage treatment process removes the grease, fats and remaining sludge from the water so it can be safely disposed of – back into the water cycle.
- Wide Bay Water reuses almost 100% of its wastewater to irrigate sugar cane, tea tree and other pastures.



In Hervey Bay there is 560 kilometres of underground pipelines.





As you can see the water supply and sewage treatment processes require lots of pipes, pump stations, treatment plants, storage reservoirs and dams. All this costs a lot of money to build and maintain.

If we were to suddenly replace everything, it would cost \$15,000 per household throughout Queensland. As you can see, there is a big cost associated with water.

How much water do you think we use daily?

200 litres or about 22 bucketfuls? 400 litres or about 44 bucketfuls? 600 litres or 66 bucketfuls?

Well it might surprise you but each and every one of us use, on average, 635 litres of water every day and that is about 70 bucketfuls of water. Or to put it another way, we use roughly 4 bathtubs full of water daily.

Now, we don't use this 635 litres all by ourselves. Industry uses water on our behalf to manufacture the clothes we wear, to provide us with the food we eat and to supply us with all types of goods and services we use daily.

Your school uses water, Councils use water in their parks and gardens, shopping centres use water, sporting clubs use water and your mums and dads use water at work. And what about the fire brigade – they use water to fight fires. In fact, we use water everywhere. Steam, or super hot water, is used by hospitals to sterilise implements.

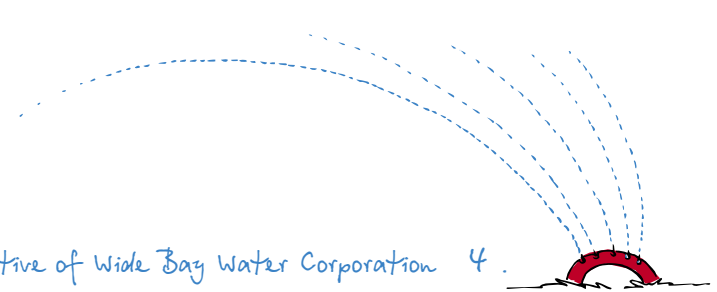
Remember earlier how it was mentioned that industry uses water on our behalf to manufacture products for us. Well, take soft drinks for example, water is not only used in the soft drink itself, it is also used to wash and sterilise bottles before they are filled.

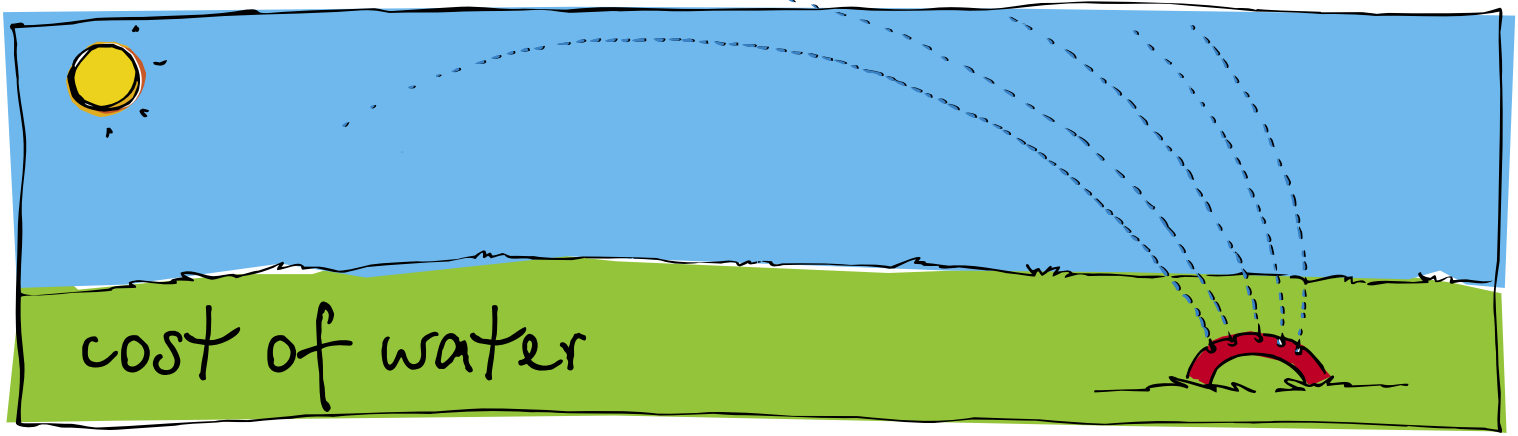


Industry uses water in lots of ways. Did you know that it takes 200 litres of water to manufacture one pair of mum's pantihose and 250,000 litres of water to manufacture your parent's car? As you can see, we use water in many different ways.

How did we arrive at the figure of 635 litres of water per person per day?

Well, we divide the total water usage by the population of Australia, and that averages out at 635 litres per person per day. But that does not tell us how much water we actually use ourselves at home. So how much water does the family use at home each day?





Well, in your home today, your family will use, on average, about 1,300 litres of water, or 650 two litre milk containers. Where do we use all the water?

Inside the home, water is used:

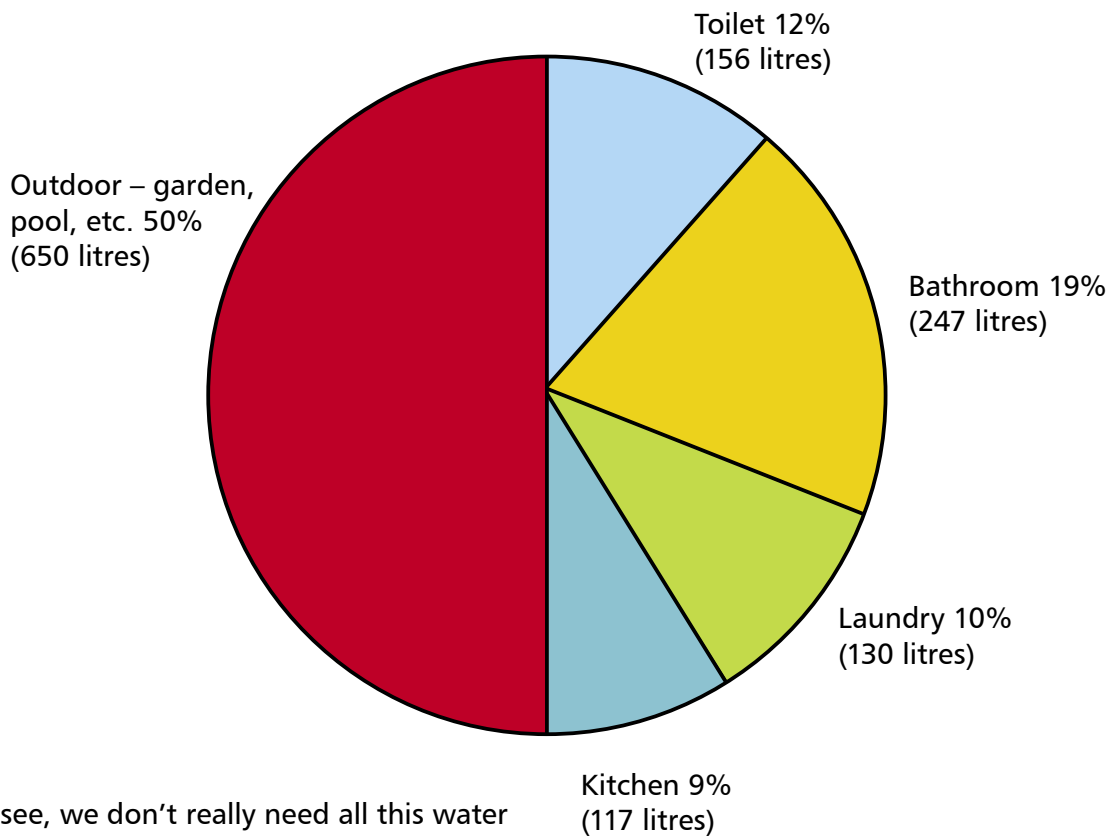
- in the kitchen for cooking and washing up
- in the laundry to wash our clothes
- in the toilet
- in the bathroom to wash ourselves, clean our teeth and wash our hands

Outside the home, we use water to:

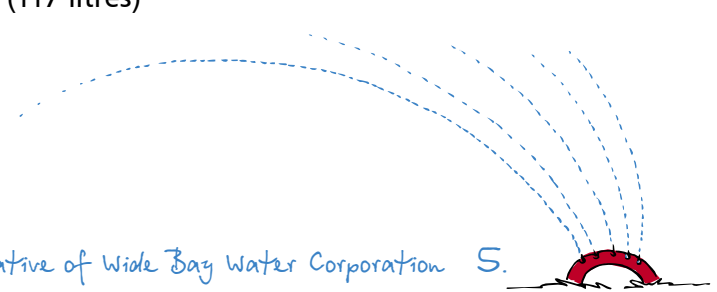
- water the gardens and lawns
- hose down the driveway and windows
- washing the car, and
- to top up the pool

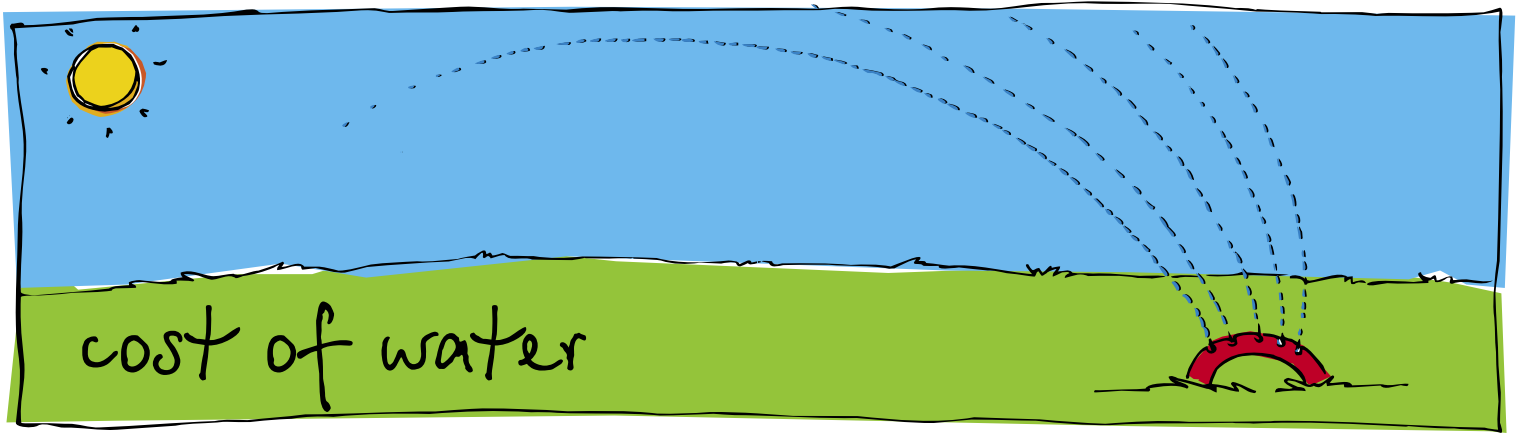
Of the 1,300 litres of water the family uses daily, we physically consume or drink less than 1%, and some 50% of our household water is used outside the home – hosing the gardens, washing the cars, etc.

ON AVERAGE, EACH HOUSEHOLD USES 1,300 LITRES OF WATER PER DAY



As you can see, we don't really need all this water and there are plenty of places where we can start to save water. We use hundreds of litres every day without giving a thought to how efficiently we are using it.





Do we really need to use so much water?

We are all guilty of misusing water. How many of you left the water running when you brushed your teeth this morning? Well, if every Queenslanders turned off the tap while brushing we would save 10 Olympic swimming pools of water every time.

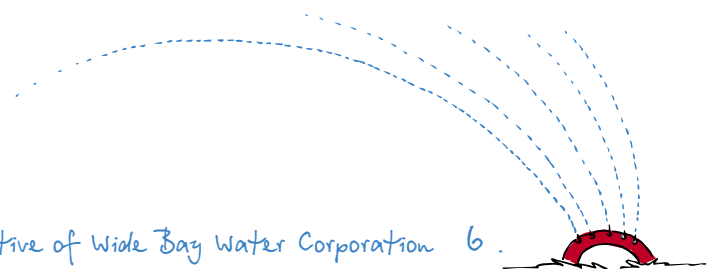
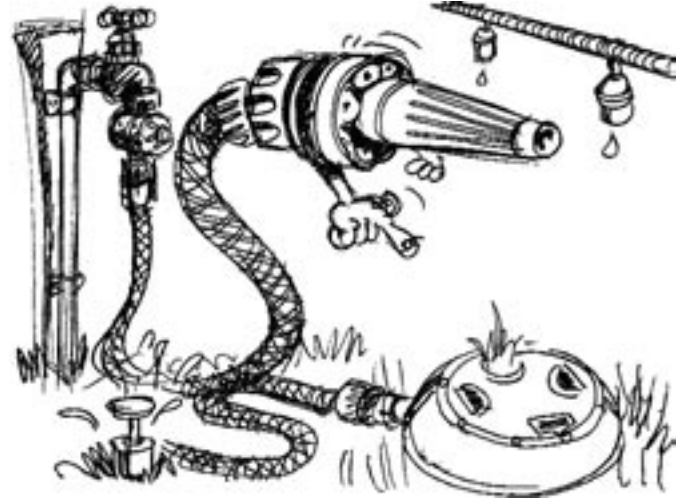
How and why to conserve water

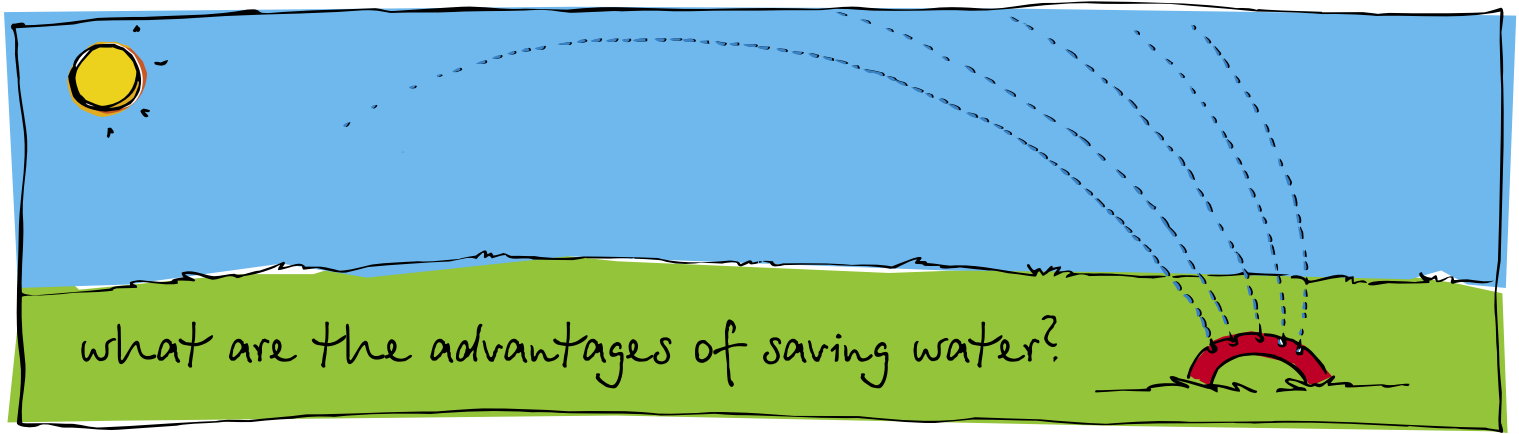
Everyone uses water and as you can imagine all the dams, pipes, pumping stations, treatment plants and reservoirs cost a lot of money to build and maintain. There are also large costs involved in the supply of water and in the removal of the sewage and wastewater from our homes.

Population growth, modern technology in the form of dishwashers, in-sink garbage disposal units, etc and industrial growth are creating an increase in the demand for water. More water has to be collected and more water has to be disposed of. For example, records show that:

- in 1931 Brisbane residents used 200 litres of water per person per day
- in 1964 this had grown to 350 litres
- and today this figure stands at 635 litres of water per person per day.

As you can see we are using more and more water each year.





what are the advantages of saving water?

How saving water saves money and the environment

Obviously, saving water saves us money. Saving money is not the only issue with water conservation. The environment is also under threat from our ever increasing use of water.

Dams and weirs have a huge impact on the environment and can involve the flooding of land that is not only valuable for agricultural production but also as habitats for our native wildlife, plant and animal species.

If we reduce our water consumption by as little as 20% we can defer the building of new dams. This will save lots of money and save hundreds of hectares of valuable land from permanent flooding.

To save water we just have to break those bad water usage habits and think about more efficient ways to use water. Here are some more ways to save water...

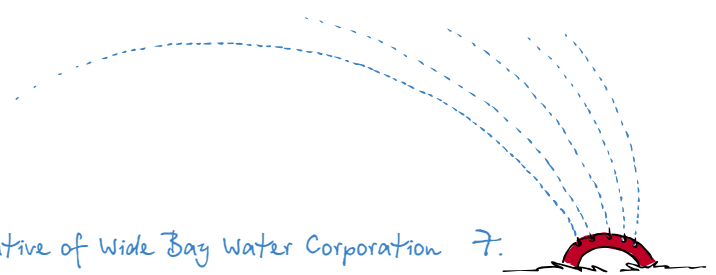
Indoors

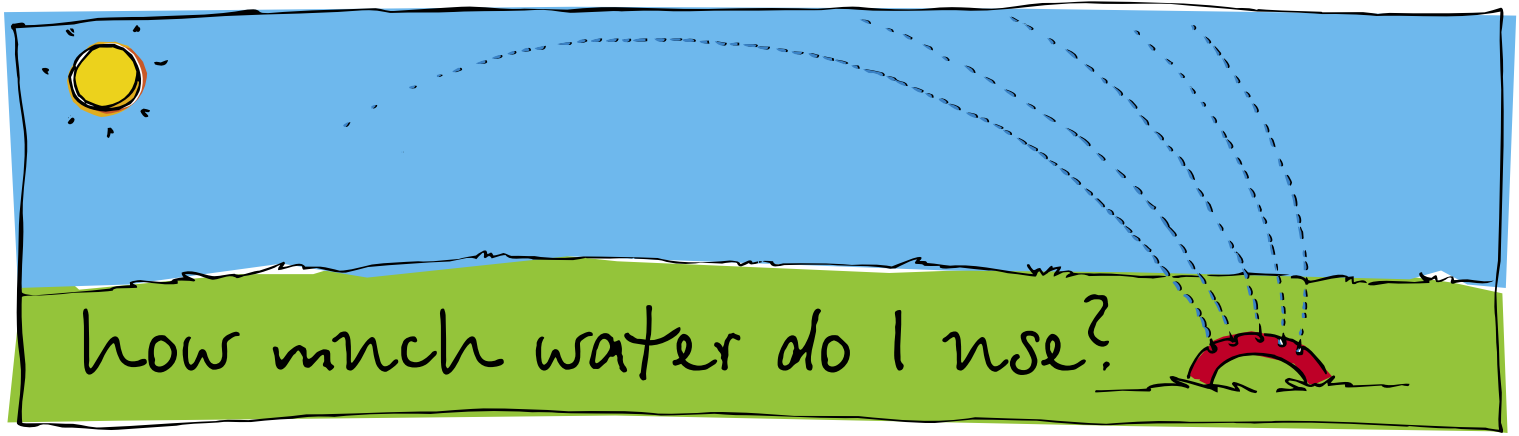
- Report leaking taps or taps that are hard to turn off to your parents so they can arrange to have them repaired – remember a tap that drips once every second wastes 30 litres of water every day.
- Use washing machines and dishwashers only when there is a full load.
- Ask mum or dad to install water saving shower heads and flow restricters throughout the house.
- Take short showers – if you want a long soak, take a bath.
- Turn the tap off when brushing your teeth and use a glass of water for rinsing.
- When cooking, rinse vegetables and dishes in a plugged sink of water, not under a running tap.
- If you convert your old toilet to a new 6 litre/3 litre dual flush toilet – you could save up to 9 litres of water each time you flush.

- Buy appliances with a high water conservation rating – the “AAA” rating developed by Standards Australia as a water usage guide for consumers.

Outdoors

- Avoid watering the lawn and gardens on hot or windy days – most of the water evaporates before it reaches the plant root system.
- Keep your garden free of weeds – weeds use water too.
- When sprinkling, use a timer tap on the hose. Unlike us, timer taps do not forget to shut the water off.
- Get mum or dad to install a drip system or micro sprays in garden beds – these are 40% more efficient than conventional hand held hoses and allow water to penetrate deep into the soil reducing surface runoff.
- Water the base or root ball of the plant not the leaves.
- Use a good mulch on your gardens to reduce evaporation.
- Toughen-up your lawns and gardens, water them only twice a week.
- Grow drought tolerant lawns and garden plants.
- Use a trigger nozzle on your hose.
- When washing mum or dad’s car, use a bucket and sponge, not the hose and wash the car on the lawn not on the concrete driveway, this way the lawn gets to have a drink while you clean the car. Only use the hose to quickly rinse the suds off the car.

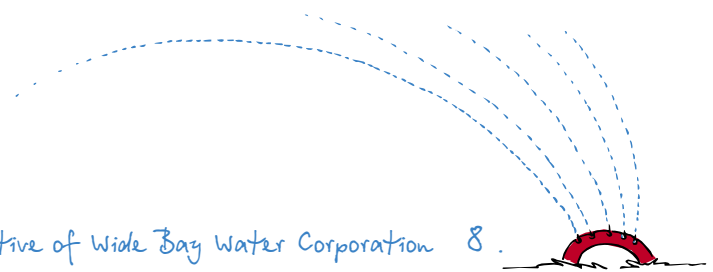


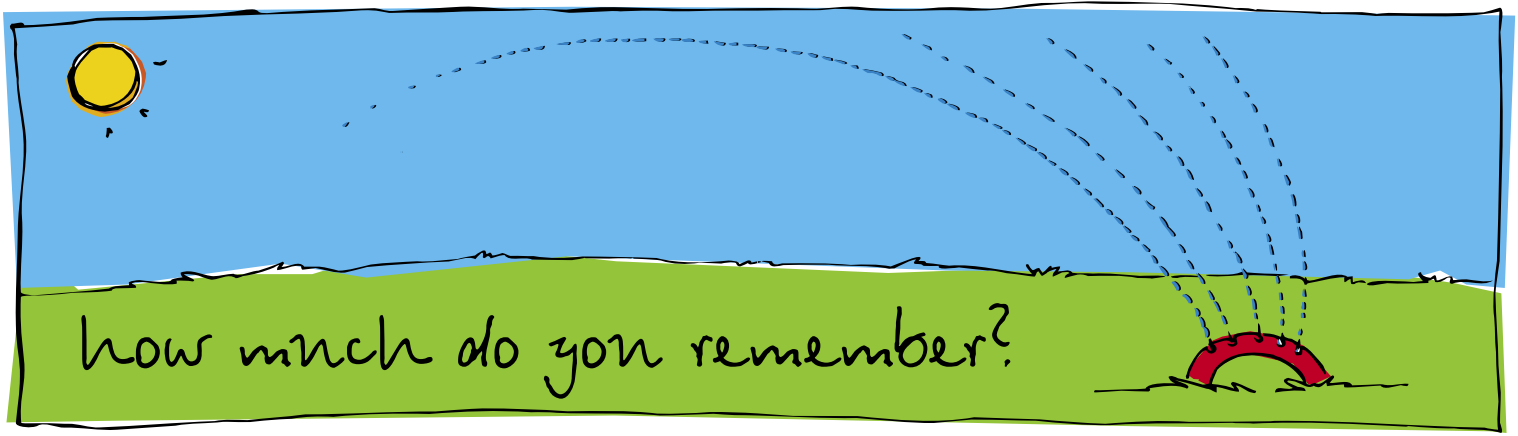


A tap dripping at one drop per second wastes 20 litres of water per day.

Here are the amounts of water used in a typical household:

Toilet	11 litre single flush 9 litres single flush 1 1/6 litre dual flush 9/4.5 litre dual flush
Bath	50 to 120 litres (half full)
Shower	70 to 160 litres per 8 minute shower
Dishwashing by hand	12 to 15 litres per wash
Dishwasher	20 to 60 litres per wash (current models)
Clothes Washing	Front loading – 23 litres per kg of dry weight clothing Top Loading – 31 litres per kg of dry weight clothing
Garbage disposal unit	30 litres per day
Hand basin	5 litres
Tap running while cleaning teeth	5 litres
Drinking, cooking, household cleaning	Average of 8 litres per person per day
Hand watering by hose	600 to 900 litres per hour
Garden sprinkler	Up to 1,500 litres per hour
Car washing with a hose	100 to 300 litres
Filling a swimming pool	20,000 to 55,000 litres
Dripping tap	20 litres per day
Leaking pipe	300 litres per day from a 1.5mm hole





See if you can fill in the blanks. Use the words below to complete the sentences. The words can only be used once. Good luck!!!

10 Olympic swimming pools, running, condensation, 560, evaporation, Lenthalls, treated, wastewater, Ghost Hill, 635, transpiration, Pipes, precipitation

- The water cycle consists of 4 parts: evaporation, transpiration, _____ and precipitation.
- _____ is when the sun's rays draw up water from the oceans, lakes and rivers of the world.
- Plants and trees also put water into the atmosphere. This process is called _____.
- The water vapour coming from the spout of a boiling kettle is an example of _____. When the water is drawn up into the atmosphere it cools and forms clouds. This is also called condensation.
- When the water moisture in clouds become too heavy for the atmosphere to support, it falls back to earth in the form of rain, hail, sleet or snow – this is _____.
- The name of the dam that has been build across the Burrum River to supply water to Hervey Bay is called _____ Dam.
- Water is _____ or purified to remove harmful bacteria that could make us sick.
- The reservoir that supplies water to Hervey Bay is located at _____.
- _____ link the reservoir to your house which are buried under the streets and footpaths of our town.
- In Hervey Bay there is _____ kilometres of underground pipelines.
- Inside the house water from the shower, bath, kitchen sinks, and washing tubs goes down the plughole. We also use water when we flush the toilet. This used water is known as _____.
- Wide Bay Water _____ almost 100% of its wastewater to irrigate sugar cane, tea tree and other pastures.
- We each use approximately _____ litres of water per day.
- If every Queenslander turned off the tap while brushing their teeth, we would save _____ of water every time.
- When cooking, rinse vegetables and dishes in a plugged sink of water, not under a _____ tap.

