BBC BITESIZE

Hello. I'm Dr Alex Lathbridge and this is Bitesize Biology.

This is the fourth episode in a series all about ecology and in this episode, we're going to talk about the water cycle.

What kind of things do you think about when you're on the toilet?

I'm usually scrolling aimlessly on my phone but every so often, a thought comes into my head.

When I'm finished up here and I flush, where does all that water go?

Obviously, down the drain and into the sewers, but where then? Does it end back in the sea? Will it ever be in a cloud again?

In the last episode, we looked at how carbon is cycled through organisms and the atmosphere, and water is the same, in fact it's even simpler as last time.

Water gets constantly recycled in a process known as the water cycle, providing water for organisms, plants and animals, including humans, over and over and over again.

Water is essential for everything. Some organisms can survive without water for a short period, but they will eventually die without it.

There are lots of different processes going on simultaneously in the water cycle.

You need to know the names of the key processes and what happens to water during each stage, and like our episode on the carbon cycle, it might help to draw a diagram.

We're going to start with energy from the sun. It comes down and causes some of the water to evaporate.

Evaporation is the movement of water to the atmosphere from ponds, lakes, oceans and even puddles.

Evaporation turns water from a liquid into a gas: water vapour. Water vapour is carried upwards, as warm air rises. You might have seen this in action if you've ever hung out washing outside for it to dry.

But evaporation also happens in plants. This is known as transpiration (we talked about transpiration in plants in our series on The Cell so I'm going to take this opportunity to say 'make sure you download that series and have a listen, as understanding the cell is key to understanding biology, so even if you've already heard it, listen again).

Plants maintain a constant column of water from their roots to their leaves, for transport and support. They allow some water to evaporate into the air from their leaves, so that more water is continually pulled up from their roots.

Alright, so we've taken lots of liquid water and turned it into water vapour, a gas.

As it moves up into the colder atmosphere, this gas cools and accumulates in the air to form clouds. This conversion from gas to liquid is called condensation. Like how if you're taking a hot shower and the steam hits the cold window and drips down as water droplets? Exactly.

So, we have taken water vapour and made it into a liquid: clouds.

Cloud transport is the next step. This is where the water held within the clouds gets blown many miles by strong winds and so the water within travels to other areas.

And of course, all that water locked in the clouds has to go somewhere.

This is where we get precipitation: rain, snow, hail and sleet falls from the clouds onto land, providing water for plants and animals.

Much of the water from precipitation will be absorbed into the ground, this is known as infiltration.

This is where water is absorbed by the ground beyond soil and stored within underground rocks called aquifers.

But if there is a large amount of rain or if the ground is already full of water, some water runs along the surface of the ground. This is known as surface runoff. Too much can be bad as it can lead to flooding, if unmanaged.

Water then drains into the sea and rivers, where the sun evaporates it from, and the whole water cycle starts over again.

So, to do a quick recap of the water cycle:

Water evaporates (in plants, it transpirates) into the atmosphere which turns it into a gas, called water vapour

Condensation turns water vapour back into a liquid which is stored in clouds.

Cloud transportation moves water to different areas.

Precipitation takes water from the clouds and pushes it back to land.

Water goes into the soil, which is underground, and is stored in rocks called aquifers, this is known as infiltration.

But, if it doesn't go down, this is known as surface runoff, and excess water is taken along the surface of the ground.

This is then drained into seas and rivers, that are once again, evaporated.

I'm Dr Alex Lathbridge and this is Bitesize Biology. All episodes available now on BBC Sounds.