

Module 1: The Water Cycle

Early Learning Water Education Program



Module overview

Learning Elements	Group Discussion	Activity
1. What is the Water Cycle and How Does it Rain?	Where does water come from and how does it get there?	Water cycle role play using musical instruments and movement Complete the water cycle activity sheet
2. What are Clouds Made From?	What are clouds? Are they all the same shape, size and colour? How does it rain?	Cloud Study- outdoor activity using observation and reflection skills Cloud Creations - art and craft
3. Where Does the Rain Go?	Where does the water go when it rains and what happens to it?	Making it rain- an outdoors experiment that involves hypothesising and investigating

Note: All URL's and links used throughout the Module are accurate and current at the time of publication.

Alignment with Early Years Learning Framework

Outcome 4: Children are confident and involved learners.

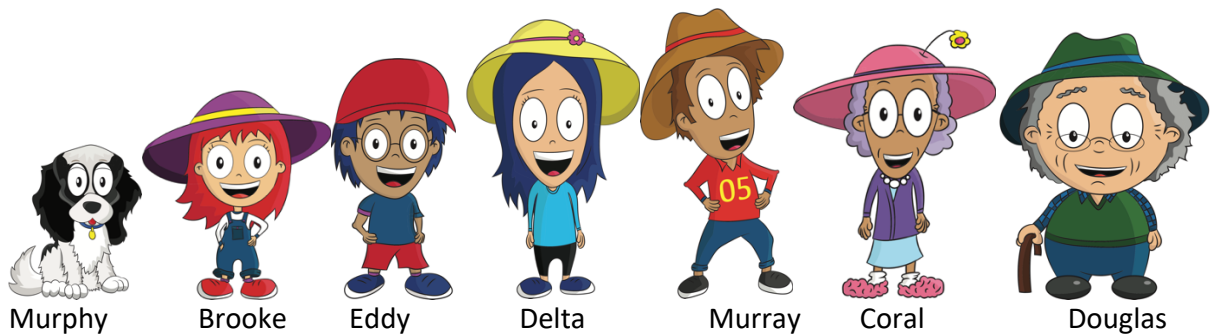
- Children develop a range of skills and processes such as problem solving, inquiry, experimentation, hypothesising, researching and investigating.
- Children transfer and adapt what they have learned from one context to another.

Outcome 5: Children are effective communicators.

- Children interact verbally and non-verbally with others for a range of purposes.
- Children express ideas and make meaning using a range of media.

Telling the story of water

Meet the Wade family, they will help us tell the story of water.



Key terms

Term	Definition
Water cycle	The water cycle, also known as the hydrologic cycle or the hydrological cycle, describes the continuous movement of water on, above and below the surface of the Earth.
Evaporation	Evaporation is the process by which water changes from a liquid to a gas or vapour. Evaporation is the primary pathway that water moves from the liquid state back into the water cycle as atmospheric water vapour.
Condensation	The change of a gas or vapour to a liquid, either by cooling or by being subjected to increased pressure. When water vapour cools in the atmosphere, for example, it condenses into tiny drops of water, which form clouds.
Precipitation	Precipitation, all liquid and solid water particles that fall from clouds and reach the ground. These particles include drizzle, rain, snow, sleet and hail.
Ground water	Groundwater is the water present beneath Earth's surface in soil pore spaces and in the fractures of rock formations
Surface water	Surface water is any body of water above ground, including streams, rivers, lakes, wetlands, reservoirs, and creeks
Urban water cycle	The way water is collected, used and managed in built up environments.

Background information

While over 70% of the earth's surface is covered by water, nearly all of this (97%) is saltwater. Ice makes up a further 2%, which leaves only 1% of all the water on the planet suitable for human needs.

The amount of water on the planet does not change, however water is recycled over and over again. This process is called the *hydrological* or *water cycle*. As water travels through the cycle, it changes shape, form and taste. Three major processes drive the *water cycle*: *evaporation*, *condensation* and *precipitation*. *Evaporation* occurs when water is heated changing it from a liquid to a gas (water vapour). The sun heating the ocean produces most of the water vapour in the atmosphere. *Condensation* occurs as the water vapour rises. It cools and changes into tiny droplets of water seen as clouds, fog or mist. As water vapour continues to rise, the water drops cool and become heavier. Eventually the water drops will fall as rain hail or snow, this is called *precipitation*.

In Australia, water is collected from two main sources, groundwater and surface water. *Groundwater* is rain that has drained underground and collected in impermeable layers. *Surface water* is rain that has drained into rivers or creeks, or been collected in dams.

People modify and manage the natural water cycle to make sure we have a safe and reliable water supply and that used water is removed and cleaned to protect public health and the environment. This is known as the urban water cycle.

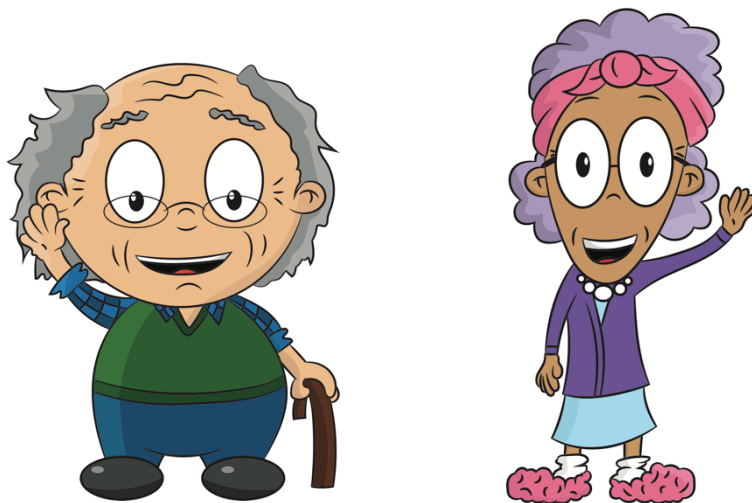
The urban water cycle is the way water is collected, used and managed in built up environments such as Bathurst. In an urban environment, people interact with the natural water cycle by collecting and storing water for use, adding things to water, like rubbish and pollutants, and building structures, roads and other hard surfaces that interrupt the flow of water.

The urban water cycle is a system that helps to manage these interactions so there is enough clean, safe water to service the Bathurst community, protect public health and protect the environment. The urban water cycle is made up of elements such as dams, water filtration plants, water pumping stations, drinking water supply pipes, wastewater treatment plants and pumping stations, wastewater pipes and stormwater drains and pipes. We will learn more about these elements in Modules 3 and 5. Bathurst Regional Council are responsible for managing the urban water cycle in Bathurst.



Support materials, links and additional resources

- Video: Bathurst Regional Council– [Module 1: The Wade Family - The Water Cycle](#)
- Website: Bathurst Regional Council: [Catchments and water supply](#)
- Website: National Geographic Kid: [The Water Cycle](#)
- Video: [Sydney Water Cycle](#) Animation
- Website: [Sydney Water resources](#) for students and teachers
- Video: [Water Cycle](#)
- Song: Youtube - [The Water Cycle](#)
- Book: The Snowflake: A Water Cycle Story (Neil Waldman)
- Book: One Well: The Story of Water on Earth (Rochelle Straus)
- Book: A Drop in the Ocean: The Story of Water (Jacqui Bailey and Matthew Lilly)
- Book: Enviro-stories- [The Raindrop](#), Inverell Public School-(downloadable PDF book)



Learning Element 1: What is the water cycle and how does it rain?



I love going for a swim in the creek, with my mum and dad supervising. Sometimes the creek is full, and sometimes there is hardly any water at all.

Why is that?

Let's learn about the water cycle!

Group discussion: Where does water come from and how does it get there?

Resources for learning:

- o *Activity Sheet: Complete the Water Cycle.*

Note: This group discussion uses a relatively simplistic description of the Water Cycle process for the purposes of explaining the concept to young children.

- **Using the Activity Sheet: Complete the Water Cycle**, ask children to think about where they see water in the natural environment. Do they know where this water comes from or how it gets there?
- Explain to children that water can be found in three different forms: as a solid, as a liquid and as a gas (vapour). Demonstrate the three forms by showing the children water in solid form e.g. an ice cube, water in liquid form e.g. a glass of water, and water in gas form e.g. steam from a boiling kettle.
- Introduce children to the concept of the water cycle and explain how water is recycled over and over again. Demonstrate the journey of a water drop as it is heated by the sun (evaporates) and travels from the ocean up into the sky as water vapour. As the water vapour rises, it cools (condenses) and the water drops form clouds. As the water drops become heavier, they will fall back onto the land and rivers as rain, snow or hail (precipitation) before eventually returning to the ocean where the water cycle starts again.

Activity:

Water cycle role play using musical instruments and movement

Resources for learning:

- *Musical instruments, suggestions include triangle, wind chime, cymbals, castanets, clap sticks, dry rice in a plastic jar with lid, xylophone and drum.*

Note: The musical instruments and movements suggested below are just a guide.

Divide the children into five groups. Each group will represent one stage of the water cycle. Using musical instruments and movement, guide each group to dramatise their stage of the water cycle. Repeat this activity a number of times to demonstrate how water moves through the cycle over and over again.

- **Group 1: The Sun**

Select one child to play the triangle representing the sun evaporating the water from the ocean. The rest of the children wriggle their fingers in an upward motion from their toes to their head to demonstrate the movement of the water vapour.

- **Group 2: The Clouds**

Select one child to wave a wind chime to represent the wind blowing the clouds across the sky. As the clouds get cooler, the water vapour turns into tiny droplets of water, a process known as condensation. The rest of the children wave their hands in the air from left to right as though they are being blown by the wind and shivering as they get colder.

- **Group 3: The Rain**

Select one child to crash the cymbals to represent thunder and another child to clap castanets to represent rain falling (precipitation). The rest of the children wriggle their fingers and wave their arms and bodies in a downward motion to depict the rain falling from the clouds back to the land.

- **Group 4: The Land**

Select one child to play clap sticks or shake a plastic container that holds some rice, to represent the rain hitting the land. The rest of the children can jog on the spot slowly at first and then faster and faster to show the rain hitting the land and then travelling into the ground (as ground water) or running over the land (as surface water).

- **Group 5: The River**

Select one child to run the xylophone wand back and forth over the xylophone keys representing the flow of water in a river. The rest of the children hold their arms out in front of them and as the xylophone is played, they roll their hands over and over each other as if they were a flowing river.

- **Group 6: The Ocean**

Select one child to play the drums representing the crashing waves. The rest of the children put their arms out in front of them and raise and lower them making the shape of waves.

Activity: **Complete the water cycle activity sheet**

Resources for learning:

- *Activity Sheet: Complete the Water Cycle*
- *Scissors, coloured pencils/pens, glue*
- Revise each stage of the water cycle. Using the **Activity Sheet: Complete the Water Cycle** provided, ask the children to colour and cut out each picture from the bottom of the page.
- The children can then paste each picture into its correct sequence on the activity sheet.
- Ask the children to colour in the activity sheet.



Learning Element 2: What are clouds made from?



I was just about to go and water the garden but there are lots of grey clouds in the sky.

It looks like it might rain!

What do the clouds look like where you are?

Let's learn more!

Group discussion: **What are clouds? Are they all the same shape, size and colour?** **How does it rain?**

Resources for learning:

- *Activity Sheet: Complete the Water Cycle*
- Ask children to describe clouds i.e. what colours are they, what shapes are they and when and where do they see them?
- Do they know what clouds are made from? Ask children if clouds change or if they are always the same? Do they see more or less clouds on different days and at different times of year?
- Remind children about the role of clouds in the water cycle.

Activity: **Cloud study - outdoor activity using observation and reflection skills**

- Take the children outside and find a shaded area where they can see the sky and the clouds. If room allows, ask them all to lie down and study the clouds.
- Ask them to describe what sizes and shapes they can see and what colours the clouds are. Ask them whether the clouds appear to be moving or staying still.
- If possible, repeat this exercise several times in a day, or over several days, to demonstrate that clouds move, and change shape and colour.

Activity: Cloud creations

Resources for learning:

- *Activity Sheet: Cloud Template (optional)*
- *A4 card/paper, cotton wool pieces, scrap newspaper, paints, blue ribbon or blue paper (or similar), sticky tape, hole punch, string*
- Use the **Activity Sheet: Cloud Template** provided, or ask children to draw their own clouds on a piece of A4 paper or card.
- Ask children to carefully cut out their clouds and decorate them. Cotton wool pieces, scrunched up newspaper and paints are most effective for this activity.
- Use thin strips of blue paper, or blue ribbon (or similar) to depict the rain drops. Stick the ribbon or paper strips along a piece of sticky tape and tape this along the bottom of the clouds.
- Punch a hole in the top of each of the clouds and thread with string. Hang the cloud creations from the ceiling to create a cloud filled sky in your room!



Learning Element 3: Where does the rain go?

I love to walk in the rain and splash in puddles in my gumboots.

Where does all the water come from, how does it get there and what happens to it next?

Let's learn more about rain!



Group discussion:

Where does the water go when it rains and what happens to it?

Resources for learning:

- o *Video: Module 1 The Wade Family - The Water Cycle*
- Ask children to think about when it rains. Where does the rain come from and where does it go to? Ask them to think about where the rain lands. Does it all land on the same spot or on different places? What do they think would happen differently to rain that lands on the road, rain that lands on the houses, rain that lands on the grass and rain that lands on the sandpit?
- Where does most of the rain eventually end up? Revisit the water cycle and the journey of the water drop once it falls back to the ground.
- Explain that some of the rain is used by the trees and plants, some is stored in the dams or reservoirs, some flows back to the ocean via streams and rivers, and some soaks into the ground where it may be stored or moves slowly through the ground before ending up in the ocean.
- **Watch Video: Module 1 The Wade Family - The Water Cycle**



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Activity: Making it rain- an experiment

Resources for learning:

- 1 litre clear plastic bottles with lids (label removed) and/ or small watering cans with rain flow spout
- Sharp scissors (or similar, for use by educators only)
- Bucket of water

Note: It is recommended that an adult prepare the rain bottles. Having several bottles to share around the group will allow the children to conduct their own experiments, following the teacher demonstration. The quickest way to fill the bottle is to remove the lid and immerse the bottle in a bucket of water

- Take a clear, 1 litre plastic bottle (labels removed). Punch (or drill) one hole in the lid and several holes in the bottom. Alternatively, small watering cans with rain flow spouts could be used.
- Take the children outside and fill the bottle with water. Demonstrate how to use the rain bottle by keeping a finger over the hole in the lid to stop the 'rain', and uncovering the hole in the lid to allow it to 'rain'.
- Ask the children to choose 3 or 4 different surfaces for it to rain on. For example, the sandpit, the path, the grass, the soil. Ask the children to watch what happens when it 'rains' on those different surfaces and explain what happens. Pour some of the water over a man-made structure e.g. a slide or cubby house. What happens to the 'rain'?
- Repeat the experiment on a path or hard cover area in a shaded area and on a path or hard cover area in the direct sunlight. Ask the children to explain what they think happens to the rain in this instance? Watch and or time how long it takes for the water to disappear in the shaded area as compared to the sunlit area and explain why this is.

