Early Learning Water Education Program



Module overview

Learning Elements	Group Discussion	Activity
1. Why do we need to save water?	Why does the weather change at different times of the year? What are the four seasons, and what weather do we associate with each season?	Weather across the seasons- art and craft decision making activity
		Creating a weather diary
		What's the weather today?
2. How can we look after water?	How many ways do we use water every day? How can we use less water and make sure it does not go to waste?	How water smart is our learning environment? Water Discovery Walk
		Create your own 'Water- Let's Make It Last' stickers
3. Creating a water smart garden	In what ways does nature- plants and animals- need and use water? What does the water do? How do we use water in our gardens at our childcare centre and at home?	Designing and creating a water smart garden

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

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Alignment with Early Years Learning Framework

Outcome 2: Children are connected with and contribute to their world.

• Children become socially responsible and show respect for the environment.

Outcome 3: Children have a strong sense of well-being.

• Children take increasing responsibility for their own health and physical wellbeing.

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.



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Key terms

Term	Definition
Freshwater	Fresh water is any naturally occurring water except seawater and brackish water.
Consumption	The action of using up a resource.
Ecosystems	A biological community of interacting organisms and their physical environment.
Climate change	Climate change is a long-term shift in global or regional climate patterns and is influenced by human emissions of greenhouse gases.
Conservation	Prevention of wasteful use of a resource.
Degradation	The process by which something is made worse, especially the quality of land.
Stormwater	Stormwater is surface run-off from rain and storms that enters our drains.
Stormwater pollution	Stormwater can carry materials such as soil, organic matter, litter, fertilisers from gardens and oil residues from driveways and pollute downstream waterways.
Water restrictions	Water restrictions have been enacted in many cities and regions in Australia in response to chronic water shortages resulting from the widespread drought. Depending upon the location, these can include restrictions on watering lawns, using sprinkler systems, washing vehicles, hosing pavements, refilling swimming pools, etc.
Drought	A prolonged period of abnormally low rainfall, leading to a shortage of water.
Water smart	A form of water conservation traditionally used to describe plant adaptations in response to drought stress, including drought escape, drought avoidance, and drought tolerance.
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.
Mulch	A layer of material applied to the surface of soil. Reasons for applying mulch include conservation of soil moisture, improving fertility and health of the soil, and weed suppression.

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Background information

Freshwater is essential to human existence, and to the functioning of the ecosystems that support us. Australia is the driest populated continent on earth and can yield only a limited amount of freshwater. The average annual rainfall in Australia of around 470mm a year is well below the global average. Despite this, Australians are the greatest per capita consumers of water, using an average of 100,000L of freshwater per person each year. This figure does not include the significant quantities of water embodied in the food and products we consume.

Available freshwater resources are expected to decline with changes to rainfall patterns accompanying global climate change. As our population grows, so does the pressure on water use. To ensure future supplies of fresh, clean water we need to use it more carefully.

In addition to the problems of limited supply, the way we use water contributes to a range of ecological problems. Conserving water resources, even in areas without shortages, helps reduce the need to build dams, protects river health by reducing the need to extract water, reduces wastewater produced and treated at sewage plants, lowers energy requirements for treating and transporting water and wastewater, and reduces greenhouse gas emissions. Managing surface runoff and stormwater pollution helps to prevent the degradation of rivers, wetlands and oceans.

The two big issues that households can help to address are:

- Reducing the *quantity* of water we consume
- Improving water quality by managing stormwater and wastewater

Homes and gardens are directly responsible for about 12% of Australia's water use and much can be done in the home and garden to reduce water use and the impacts of stormwater and wastewater.

Australia is the driest populated continent on earth, and yet Australians are the greatest per capita consumers of water in the world. While action by government at all levels can help to reduce water use, it is actions by individuals in the home, at work, and at play, that are also important in conserving this valuable resource. By checking, monitoring and reducing our water use, we can ensure the sustainability of our water supply for the future.

Bathurst Regional Council has implemented a range of drought management actions in accordance with its <u>Drought Management Plan</u>, water restrictions are part of this plan and relate solely to Bathurst's water supply. Alternative water supplies do exist, including bores, wells, independent rainwater tanks (not filled/topped up from Bathurst water supply) and water sourced from supplies outside the local government area (LGA).

There are different levels of water restrictions enforced in Bathurst based on the level of the Chifley Dam, the main source of Bathurst's water supply. From late 2019 through to mid 2020, Bathurst's water restriction level was *extreme* with Chifley Dam level dropping to a low of approximately 29%. Depending on the level of water restrictions in place, number of activities by residents, business, community groups and Council are prohibited or carefully managed, to help conserve water supplies.

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The following table shows an example of how different levels of water restrictions can be used to change water consumption and conserve water supplies during dry times.

	Enforced Restrictions		
	HIGH	EXTREME	CRITICAL
In Effect	26/11/18	14/10/19	15%-0%
Watering – Lawns	Odds and evens 6am-9am or 6pm-9pm Maximum 30 minutes/day	Not permitted	Not permitted
Watering – Gardens	Odds and evens 6am-9am or 6pm-9pm Maximum 30 minutes/day	Above 29% hose and trigger nozzle permitted for 30 minutes/day on Wed & Sun only 6pm – 9pm Below 29% bucket or watering can permitted for 30 minutes/day on Wed & Sun only 6pm-9pm	Not permitted
Car Washing - At Home	Bucket & trigger nozzle on lawn 6am-9am or 6pm-9pm	Not permitted	Not permitted
Swimming Pools	Top up: 6am-9am or 6pm- 9pm with pool covers First fill: with Council permission	Top up & filling not permitted	Top up & filling not permitted
Garden Features & Temporary Child Pools	Top up & filling permitted	Top up & filling not permitted	Top up & filling not permitted
Washing Hard Surfaces	Not permitted	Not permitted	Not permitted
Indoor Activities	Water wise actions required	4 minute showers or 1 bath/person/day (150mm deep) Water wise actions required	3 minute showers or 1 bath/person/day (100mm deep) Water wise actions required



Advertising artwork used to communicate water restrictions to the Bathurst community

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Support materials, links and additional resources

- Video: Bathurst Regional Council <u>Module 4: The Wade Family Being Conservative With</u> <u>Water</u>
- Video: <u>Tutorial by horticulturist Dhyan Blore Creating a Water Smart Garden</u>
- Website Bathurst Regional Council: <u>Catchments and water supply</u>
- Website: Bathurst Regional Council <u>Water Restrictions</u>
- Document: Bathurst Regional Council: Drought Management Plan
- Website: Smartwatermark smart water advice in the home
- Website: Smartwatermark smart water advice in the garden
- Website: Water NSW- Regional NSW drought information
- Website: Community Early Learning Australia: Respectful water play
- Website: Kids Gardening- <u>wise watering</u>
- Video: Youtube Isabella's Garden
- Website: Dirt Girl World episodes- Water, Rain
- Book Enviro-stories- Drought to Flood, Narrabri Public School
- Book Enviro-stories- How to Save Water, St Joseph's Primary school, WeeWaa
- Website: <u>Sydney Water resources</u> for students and teachers



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Learning Element I: Why do we need to save water?



I love the summer, but it does get very hot and dry! My family are saving water which means I have not had to have a bath for ages- yippee!!

I wonder when it is going to rain again

Group discussion: Why does the weather change at different times of the year? What are the four seasons, and what weather do we associate with each season?

Resources for learning:

- Video: Module 4 The Wade Family Being Conservative With Water
- Discuss seasons with the children. Do they know what the four seasons are? Introduce the 12 months of the year. Explain that the 12 months of the year are split into 4 to make up the 4 seasons: Spring (September, October, November); summer (December, January, February); autumn (March, April, May); and winter (June, July, August).
- Discuss some special events and what season they fall in e.g. Christmas, Easter, children's birthdays etc.
- Have a look outside. Ask the children to describe what the weather is doing today. Ask children to name as many different types of weather as possible (sunny, cloudy, rainy, snowy, windy, stormy etc.) Write and draw these different weather types on a board.
- Ask the children to think how the weather changes across the seasons. What is the weather like in the winter compared to the weather in the summer? Discuss the idea that in the summer, when the weather is hotter and more humid, there is more water in the air and more likely to rain and storm. Ask the children what effect this has?
- Show the children the Video: Module 4 The Wade Family Being Conservative With Water

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Activity: Weather across the seasons

Resources for learning:

- Activity Sheet: Weather Across the Seasons (A4 poster)
- Activity Sheet: Weather Across the Seasons (icons to cut out)
- Coloured pencils, scissors
- Print out a copy of the Activity Sheet: Weather across the Seasons (A4 poster) and Activity Sheet: Weather Across the Seasons (icons) for each child. Help the children to cut out the weather icons.
- Ask the children to think about the most common types of weather that occur in each of the seasons and then get them to stick the appropriate weather icon/s from Activity Sheet:
 Weather Across the Seasons (icons to cut out) in the spaces available on the Activity Sheet: Weather across the Seasons (A4 poster).
- Once completed, the children can colour in the Activity Sheet: Weather across the Seasons (A4 poster). Use the completed posters to demonstrate that it can rain more at certain times of year, and in certain seasons, than in others.



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Activity: Creating a weather diary

Resources for learning:

- Activity Sheet: Weather Across the Seasons (icons to cut out)
- o Activity Sheet: Weather Diary Worksheet
- A4 or A3 paper, pens, coloured pencils, scissors
- Get the children to keep a weather diary for a week/ fortnight. Print out and use the Activity Sheet Weather Diary Worksheet (onto A3 or A4 paper). Each day, ask the children to describe what the weather is doing. It is suggested that the children do this twice during the day; once in the morning and once in the afternoon. They can either draw the weather type onto their weather diary or alternatively choose an appropriate icon from the Activity Sheet: Weather Across the Seasons (icons) to stick to the diary.
- At the end of the week/ fortnight, discuss the different types of weather depicted on the weather diaries and how the weather changed during the time. Was there more of one weather type than another? Which weather type was there more of and why? If possible, this activity could be repeated throughout the year during the different seasons to give children a better understanding and appreciation of various weather types across the year.

Activity: What's the weather today?

Resources for learning:

- A4 or A3 paper, pens, coloured pencils, paints, brushes
- Ask children to draw or paint a picture showing what the weather is like today



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Learning Element 2: How can we look after water?



Hi again kids! While I really enjoy watering the garden and keeping the grass green, it is really important that we use water carefully. That is why I have a water tank that collects rain water from the roof, and I only water my garden in the evening when it is cooler.

Let's learn why it is important we all save water!

Group discussion: How many ways do we use water every day and how can we use less water and make sure it does not go to waste?

Resources for learning:

• Activity Sheet: Water Use Flash Cards

- Revisit all the different ways that water is used in the home and in the learning environment. Explain that water is used for drinking (to keep our bodies healthy), for washing hands and bodies (to keep us clean). However, water is also used for lots of other activities around the house and learning environment, such as washing clothes, cooking, watering the garden etc.
- Remind the children about how weather changes across the seasons and that, at certain times of the year, it can rain less than at other times of year. Also, some years can be wetter than others. Ask the children to think about what impacts this might have.
- Explain the importance of looking after water and trying to save water wherever possible.
 Using the Activity Sheet: Water Use Flash Cards from Module 2: Learning Element 2 'How
 do we use water?' ask the children to think about ways water could be saved, or less water
 could be used, during each of the activities. For example, turning off the tap when brushing
 teeth.
- Discuss other ways that water could be saved, or less water used, in the learning environment. For example, washing paint brushes in a jar of water and not under a running tap. If the learning environment has a water tank, explain what this does, how it works and how it is a good way to save water.

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Activity: How water smart is our learning environment?

Resources for learning:

- o Activity Sheet: Water Discovery Walk
- Support Resource: Examples of Stickers
- o Support Resource: Map of Bathurst Regional Council's Filtered and Raw Water System

Note: Educators may wish to refer to Module 2: Learning Element 2, Activity 'Water Discovery Walk', for instructions on how to use the worksheet.

- Take the children on the 'Water Discovery Walk' around the learning environment and discover the different ways water is being used and for what purpose. Complete the **Activity Sheet: Water Discovery Walk** as you go. Discuss whether it would be possible to use less water, or save water, in all the different areas around the learning environment. Don't forget to also go outside.
- Back in the classroom, ask the children to remember all the ways water was being used around the learning environment.
- Show the children **Support Resource: Examples of Stickers** that prompt or remind us of ways we can conserve water (known as point of source prompts) and explain that these act as reminders to save water at all the taps and toilets around the learning environment.





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Activity: Create your own 'Water – Let's Make It Last' stickers

Resources for learning:

- o Activity Sheet: Remember...Water Let's Make It Last Sticker Template
- Support Resource: Examples of Stickers
- Pens, pencils, paint, scissors, blue-tac or sticky tape, laminator & sleeves (optional)

Note: Bathurst-based educators may wish to scan and email a small selection of sticker artwork (no more than 4) drawn on the sticker templates, to Bathurst Regional Council's Environmental Programs Officer for printing purposes. A maximum of 200 total stickers/decals will be produced at no charge. These professionally printed stickers/decals of the artwork will be sent back to the educator for distribution to the children and their families. Alternatively, educators may use the sticker template for children to draw onto, then laminate and cut out the drawings and stick these to relevant surfaces around the learning environment.

Email: <u>council@bathurst.nsw.gov.au</u> attention: Environmental programs Officer

- Using the **Support Resource: Examples of Stickers** and **Activity Sheet: Remember Water Let's Make It Last sticker template**, ask the children to draw in their own water smart pictures onto the template, for example: turning of dripping taps, half flush on the toilets, take short showers, turn taps off when brushing teeth etc.
- Make copies of the stickers to use around the learning environment.
 - Send a small selection of the artwork template drawings (no more than 4 drawings) to Bathurst Regional Council's Environmental Programs Officer, for professional printing 200 stickers will be printed free of charge. Printed stickers/decals will be returned to the educator for distribution to families; OR
 - o Laminate and cut out the children's artwork
- Get the children to take it in turns to attach a copy of the water smart sticker prompts at all the taps and toilets in the learning environment as you take them on the Water Discovery Walk. Remember to also include outdoor taps.
- The completed pictures could also be taken home to assist in family discussions and to raise awareness of being water smart in the home.



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Learning Element 3: Creating a water smart garden

I love gardening and my garden is known as a 'water smart' garden so we can save as much water as possible. Do you have a garden at home or in your learning environment?

Let's learn more about what nature- plants and animals- use water for and how to create a water smart garden!



Group discussion:

In what ways does nature – plants and animals – need and use water? What does the water do? How do we use water in our gardens in our learning environment and at home?

Resources for learning:

- o Support Resource: Dry Environment
- Support Resource: Wet Environment
- Activity Sheet: Water Storage & Use
- Video: Module 4 Being Conservative with Water

Notes: Educators may wish to revisit Module 2: Learning Element 3 How do we use water?

Educators may wish to find photos of several different landscapes in wet and dry seasons.

- Using the **Support Resource: Dry Environment** and **Support Resource: Wet Environment**, or other images of Australian landscapes, show children of two different landscapes within Australia; a picture of the outback, that receives low amounts of rain, and a picture of a tropical rainforest that receives higher amounts of rain. Ask the children to describe what they see and ask them to think about why the landscape is so different in each case.
- Explain to children that it is not just humans and animals and birds that need and use water, but water is also essential for trees, plants, flowers and crops as well. Ask the children to think about, and describe, what happens to the grass and to plants that don't get regular water.
- Explain that without water, we would not be able to grow the food that we eat. Ask which children live on a farm or a rural property. Find out if they know where the water comes from? Explain that most farms have dams (that are filled up with the rain) and also bore

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water (which is water that is stored underground and is pumped to the surface using a windmill or electric pump). The dams and water bores are used for livestock and also to water any paddocks and crops. During particularly dry times of the year, the dams can dry up. Use the **Activity Sheet: Water Storage & Use** to engage the children in a game that links water storage to its use.

- Explain that plants, trees, flowers and crops all have roots underground. When it rains, the rainwater soaks into the ground. The roots of the plants suck the water up into the stems and the leaves allowing the plants to grow. All plants need sunlight and water to grow, however some plants can survive on much less water than others. While some plants will wilt and die if it does not rain for a period of time, other plants are able to withstand hot and dry conditions for longer.
- Introduce the idea of a water smart garden. Explain that water smart gardens are specially designed and planned so that they do not use as much water.
- Watch Video: Module 4 The Wade Family Being Conservative with Water



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Activity: Designing and creating a water smart garden

Resources for learning:

- Video: Tutorial by horticulturist Dhyan Blore, "Creating a Water Smart Garden"
- Raised garden bed (or similar), plants, gardening tools, mulch, watering can or hose.
- Factsheet: Education Centres (water smart gardening tips for education centres)

Notes: Educators may wish to visit the Water Restrictions pages on Bathurst Regional Council's website for more easy-to-follow factsheets that support water smart gardening

- Show the children the video Tutorial by horticulturist Dhyan Blore, 'Creating a Water Smart Garden' (12mins 45secs)
- Discuss with the children what they have learnt from watching the video and what they liked most about the water smart garden.
- Take the children into the outside area and asking them to look around and think about where might be good spot to locate a water smart garden. Ask them to think about how much sun and shade the potential garden site may get, how the garden could be watered and whether the garden is easy to access.
- Go back inside and complete a brainstorm session with the children about designing and creating a successful water smart garden. You may wish to discuss:
 - Where you are going to build the water smart garden, the size, shape and design of the garden.
 - The type of plants that you might want to grow in the water smart garden. Are you going to grow an edible garden or a flower garden? Would it be better to have plants that require lots of watering or plants that require less watering?
 - The purpose of mulch and how placing mulch around the plants helps to protect the soil and helps to capture and keep water in the soil and prevent it from evaporating. Discuss what different types of mulch could go on the water smart garden.
 - How the water smart garden could be watered. Does the learning environment have a water tank? Would there be a way of capturing the water that comes off the roof? Whose responsibility will it be to water the garden?
- Involve the children in the creation of a water smart garden for the learning environment **using the information from Dhyan and the video for inspiration**. Ensure the children are actively engaged in the planning, planting, maintenance and upkeep of this garden. Engage the children in frequent observations of, and discussions about, the water smart garden and check their learning and understanding through questions such as: How quickly are the plants growing? Are some plants doing better than others? How often does the garden need watering? What time of year is the garden most healthy etc.?
- Wherever possible, try and use 'recycled' rainwater to water this garden e.g. from a water tank, or rainwater captured in bottles or buckets from the downpipes.

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BATHURST

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Inspiration for water smart gardening in your learning environment



Left and right: Shaded play areas, native plants in raised pots, hardwearing artificial turn



Left and right and below: Worm farms are a useful way to dispose of suitable organic waste, and they provide nutrient rich liquid for plants



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Left, right and below: create interesting, sunsafe and environmentally sustainable gardens and play spaces with native plants, different materials and textures. Large trees and sails provide shade and introduce different shapes and colours to the learning environment.



Thank you to the staff and children at Goodstart Early Learning Centre Kelso for allowing us to photograph your engaging, water smart play and learning initiatives.

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