The Water Guardians program

Always learning for a thriving Tasmania

Teacher guide

TasWater's water literacy primary program, The Water Guardians, helps young students learn about the importance of water through fun, engaging, and curriculum-aligned activities. This document provides teacher resources and tips to support the water literacy program, helping students in Years 5 and 6 understand key concepts about the importance of water and how we can all look after it.

The purpose of the program is to inspire students to care for water by teaching them that we 'borrow' water from local sources. These sources are vital for native plants and wildlife. We share this water with other users like farmers, swimmers, and picnickers.

Every part of the program, from content to illustrations, is designed to focus on water in a uniquely Tasmanian context. Additional resources and links to all the lessons can be found on the teacher dashboard, giving you everything you need to support your students in learning about water and its role in their everyday lives.

Workshop overview

This workshop is made up of three interactive lessons that focus on wastewater management, habitat and catchment protection, and water conservation. Lessons are aligned with the TasWater story book 'The Water Guardians: city river rescue', and are relevant to Tasmanian water sources.

Each lesson is designed to take approximately 45 minutes and can be delivered by teachers as a group activity or completed individually by students.

The workshop is supported with offline activities, at home activities, discussion questions, and collaborative exercises to enhance engagement and understanding. It begins with a short pre-knowledge quiz to assess prior understanding, followed by the three-part lesson series. The workshop concludes with a final quiz to reinforce key concepts and assess students' understanding of the water conservation and responsible water use messages.

All activities are designed to be used flexibly; teachers may select the content that best suits their teaching cohort and environment.

Learning intentions and key messages

Students will learn to:

- Raise awareness of pollution to protect water sources for future generations
- Make a plan to protect and restore the natural environment
- Foster a sense of community responsibility in maintaining clean and healthy waterways

Students will learn about:

- The importance of wastewater management
- How to work cooperatively towards habitat and catchment protection
- Pollution and degradation of local waterways due to improper waste disposal and irresponsible visitor behaviour

Resources

Provided by program:

- Years 5-6 teacher guide
- 'The Water Guardians: city river rescue' animation – introduction to the storybook
- 'The Water Guardians: city river rescue' storybook
- Interactive classroom digital activities
- Take home activity pack
- Offline activity worksheets

Required:

- Interactive display such as an Interactive Whiteboard (IWB)
- PC or device with internet access
- Student devices (optional - if students are completing the workshop independently)

Assessment

- Pre-knowledge quiz
- Questioning
- Participation
- Activities
- Summative quiz

Differentiation

Teachers are encouraged to use their discretion when presenting the material in this workshop. Base participation on your students' individual needs, and existing knowledge and understanding. This module has been designed for Stage 3 (Years 5-6) students, with links to the Australian Curriculum.

Australian Curriculum links Years 5-6

General capabilities

- Digital Literacy
- Literacy
- Ethical Understanding
- Personal and Social Capability
- Critical and Creative Thinking
- Intercultural Understanding

English

AC9E5LY02 use appropriate interaction skills including paraphrasing and questioning to clarify meaning, make connections to own experience, and present and justify an opinion or idea

AC9E5LY05 use comprehension strategies such as visualising, predicting, connecting, summarising, monitoring and questioning to build literal and inferred meaning to evaluate information and ideas.

Humanities and Social Sciences (HASS)

AC9HS5K05 (Geography) the management of Australian environments, including managing severe weather events such as bushfires, floods, droughts or cyclones, and their consequences

AC9HS5K08 (Economics and business) types of resources, including natural, human and capital, and how they satisfy needs and wants

Science

AC9S6U01 investigate the physical conditions of a habitat and analyse how the growth and survival of living things is affected by changing physical conditions

AC9S5U02 describe how weathering, erosion, transportation and deposition cause slow or rapid change to Earth's surface

Using the online module

Introduction

Before you begin the online module, use this activity to introduce students to the processes involved in sewage management, using a hands-on approach that encourages critical thinking and creativity.

What is sewage? Sewage is a type of wastewater, which is simply used water. It includes substances such as human waste, food scraps, oils, soaps, and chemicals. In homes, this includes water from sinks, showers, bathtubs, toilets, washing machines, and dishwashers. Businesses and industries also contribute their share of used water that must be cleaned.

Sewage treatment activity

Materials needed

- Clear plastic containers (e.g. jars or cups) to represent different treatment stages (4 per group)
- Water (enough to fill each container)
- Various 'pollutants' (e.g. dirt, small pebbles, cat litter, wet wipes, detergent, food colouring, vegetable scraps, and small plastic items)
- Coffee filters or paper towels
- Strainers or colanders
- Sand or gravel
- Markers for labelling containers

Set-up

1. Divide the class into small groups of 4-5 students.
2. Provide each group with the materials listed above.
3. Assign each container to represent a different stage of wastewater treatment:
    - **Collection:** Initial wastewater with pollutants
    - **Primary treatment:** Removal of large solids (using a strainer)
    - **Secondary treatment:** Filtration through sand or gravel
    - **Tip:** fill a funnel with layers of larger pebbles, smaller pebbles and clean filter sand (find at pool supply shops) on top
    - **Tertiary treatment:** Final purification using coffee filters

Instructions

1. **Introduction:** Begin by discussing the importance of wastewater treatment and the impact of untreated wastewater on the environment and public health. (e.g. water pollution, diseases, habitat destruction)
2. **Simulation steps:**
    - **Collection stage:** Each group fills their first container with water and adds various pollutants to simulate wastewater.
    - **Primary treatment:** Students pour the contents of the first container through a strainer into the second container to remove larger solids. They should observe what is filtered out and discuss its significance.
    - **Secondary treatment:** Next, they pour the remaining water through a layer of sand or gravel in the third container, discussing how this step helps remove smaller particles.
    - **Tertiary treatment:** Finally, they pour the water through a coffee filter in the fourth container, observing how much cleaner the water becomes.
3. **Observation and discussion:**
    - Have students compare the clarity of water in each stage and discuss what they observed at each step.
    - Encourage them to think critically about what pollutants were removed and why each treatment stage is necessary.

Conclusion

- Discuss how effective wastewater treatment protects ecosystems and public health.
- Find and watch a short sewage treatment video online to consolidate what was represented in the filter activity.

Animation and Chapter 1 of 'The Water Guardians: city river rescue'

Students view the 30 second animation. Here, they will meet the animals and understand the key messages within the narrative.

The teacher will then read Chapter 1 of 'The Water Guardians: city river rescue' storybook in its entirety to students prior to beginning Lesson 1.

Challenge question – Chapter 1

Posing challenge questions to students has three key benefits.

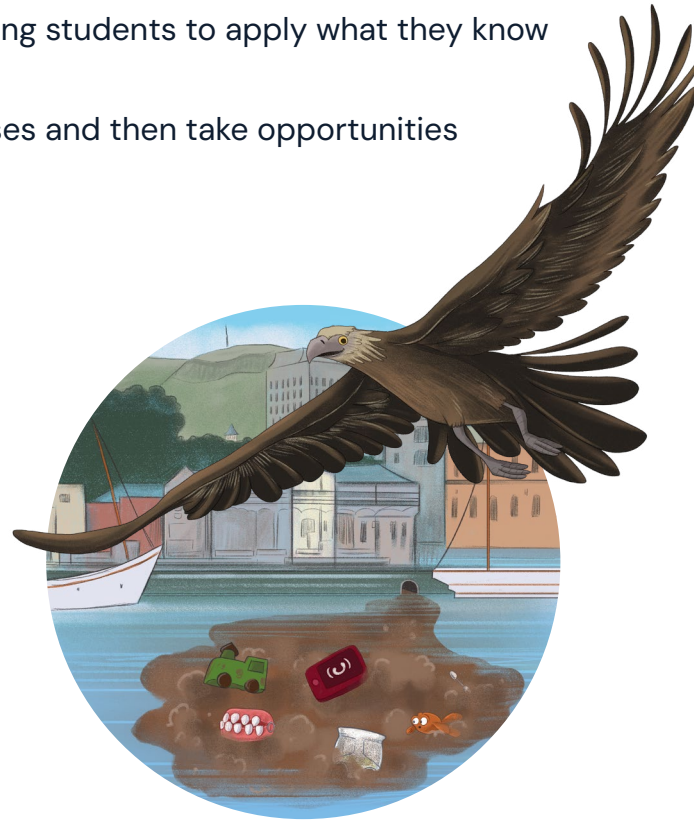
- It encourages **critical thinking** by getting them to analyse and evaluate information.
- It boosts **engagement** by making learning more interesting and motivating.
- It helps develop **problem-solving skills** by requiring students to apply what they know to real-life situations.

Ask the following questions, record students' responses and then take opportunities throughout the lesson to 'check in' with students.

Are they able to use their new knowledge to confirm, add to, or alter their responses?

Flynn noticed brown sludge mixing with the blue water of the River Derwent in Hobart. He also saw toilet paper and waste flowing out of a pipe directly into the river.

Why do you think Flynn was concerned about what he saw? Can you think of some reasons why this situation might be harmful to both animals and people living near the river?



Beginning the workshop

After listening to Chapter 1, students log in to the online workshop **Years 5-6 TasWater water literacy primary program**, via their devices (e.g. school laptops or iPads/tablets).

Students commence the pre-session quiz, and their responses will help you understand how much they already know about the topic. Discuss the responses and answers to the pre-session quiz with your class. Ask students to share their ideas and views about water in addition to any questions they have. Identify aspects they would like to know more about.

Next, guide students through the online workshop activities, one lesson at a time.

Pre-knowledge quiz questions:

Question	Answer
1. What did Flynn spot at the Derwent River that made him swoop down for a closer look?	**B)** An unusual colour in the river, from overflowing sewage
2. Why were the Water Guardian animals concerned about what all the people were doing at the disappearing tarn?	**C)** Because it is linked to the drinking water supply for Fern Tree residents
3. True or False: The 3Ps that can be flushed down the toilet are: Poo, Pee and (toilet) Paper?	**True**
4. Which of the following can be treated to turn into safe drinking water?	**D)** All of the above
5. Which of the following describes the urban water cycle?	**B)** It is where people interrupt the natural water cycle to clean and use water for drinking and other uses, before cleaning it again to return to the environment and natural water cycle
6. Which of the following organisations care about water in Tasmania?	**D)** All of the above
7. True or False: When you flush the toilet, the waste (sewage) goes straight into the ocean.	**False**

Main body of workshop

Lesson 1 (Questions 8-12)

Question 8:

- Display Question 8. Students complete the fill-in-the-blank independently.
- View the short clip.
- What are some ways you and your family can help protect Tasmanian waterways and parklands?

Question 9:

- Display Question 9. Students complete the multiple-choice question independently.
- View this short clip.
- As a class, brainstorm items that people might flush down the toilet. Teacher to record responses. Why would these items be problematic? Students consider the flow-on effect, e.g. If I flush a wet wipe, how might that affect: the plumbing, the treatment process?

Question 10:

- Display Question 10. Students complete the sorting activity and then join together in small groups to discuss the following household items:
  - Sink strainers. What purpose do they serve? Do you use them in your kitchen?
  - Rubbish bins in the bathroom. How can they stop waste entering waterways?

Question 11:

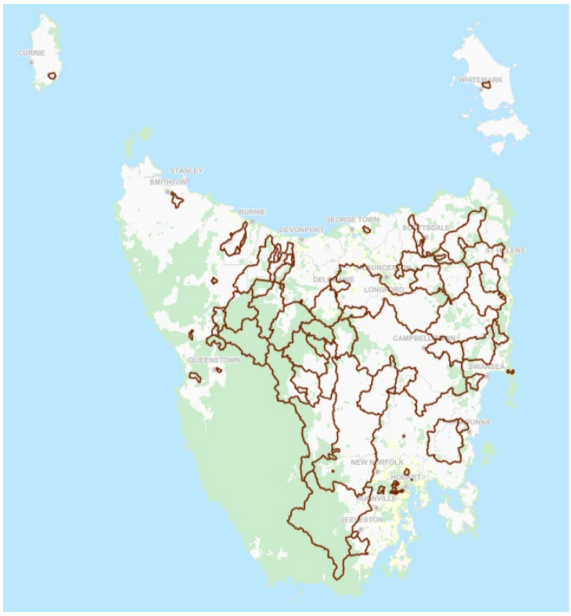
- Display Question 11. As a class, click on each hotspot and read about how important access to good sanitation is.
- In Tasmania, we are very fortunate to have constant access to clean, fresh water. This is not the case in many locations around the world. Students go to: http://thewaterproject.org/health to learn about the water crisis. Select one fact to share with the rest of the class.

Question 12:

- Display Question 12 and complete as a class.
- Where is your local water catchment? Did you know: Many Tasmanians receiving water from TasWater do not know where their supply is sourced from or where it is treated.
- Your hand as a catchment
  - Take one hand, and make a small cup with the palm. See how the lines in your hand become deeper?
  - When it rains, water flows down the lines it can find in the landscape until it either joins another river, or reaches an end point such as a lake or the ocean. Look back at the lines in your hand, and you'll see that some join together.

- Pick a couple of places on your hand and trace the path a drop of water would take to get from a high point to the 'collection area' in the centre.
- You could even use an eye-dropper to drip water onto various parts of your hand and watch it travel down the 'rivers' made by the lines.

- Have a look at the map of our catchment zones. Which one do you think you get your water from?



- View this clip to learn more about catchment areas.

Challenge question revisited – Chapter 1

Sample answers:

Why do you think Flynn was concerned about what he saw?

- Flynn was probably worried because the brown sludge and waste could make the water unsafe for animals to drink or live in. This could harm fish, birds, and other creatures that depend on the river because the increased nutrients coming into the river through the sewage can affect the water quality in the river.
- He might be concerned because sewage contains germs that can make people sick if they swim in it or use it for drinking. This could lead to health problems for people living near the river.

Can you think of some reasons why this situation might be harmful to both animals and people living near the river?

- He might know that dirty water can carry diseases that could spread to both animals and humans, causing sickness in the whole community.
- Animals might mistake wet wipes, and other rubbish that can be flushed, for food.

Lesson 2 (Questions 13-18)

The teacher will read Chapter 2 of 'The Water Guardians: city river rescue' in its entirety to students prior to beginning Lesson 2.

Challenge question – Chapter 2

Ask the following question, record students' responses and then take opportunities throughout the lesson to 'check in' with students. Are they able to use their new knowledge to confirm, add to, or alter their responses?

Paddy discovered pollution in the rivers and creeks on kunanyi/Mount Wellington.

How might the pollution affect the drinking water?

Question 13:

- Students explore the alternative water sources in Question 13.
- **Offline activity 1: All about greywater!**

1. Greywater mystery

What is greywater? Unscramble these words to find out!

TERWA MORF KSNIS, WERSOSH, DAN DNALURY

Answer: Water from sinks, showers, and laundry.

2. Design your own greywater system

Draw a simple greywater system for your home. Label where the water comes from and where it goes!

3. Greywater reuse challenge

Write down a potential reuse for each greywater source: Shower, washing machine, sink.

4. Greywater sources hunt

Circle the items in your home that produce greywater:

Toilet	Dishwasher	Kitchen sink	Fish tank
Shower	Washing machine	Bathroom sink	Swimming pool

Question 14:

- Display Question 14 and answer as a class.
- Listen to this news piece by ABC Radio Hobart.
- Aside from a news piece, what is an effective way to inform visitors at the Disappearing Tarn that swimming is prohibited in the area, and to generally look after the mountain? Students share ideas with the rest of the class and discuss pros and cons of each. Teacher to record responses for use in Question 16.

Question 15:

- Display Question 15 and have students work through independently.
- **Offline activity 2: Exploring kunanyi/Mount Wellington**

1. Draw your ecosystem

In the box below, draw a picture of kunanyi/Mount Wellington's ecosystem. Include at least 4 elements mentioned in the passage below:

What he expected to see looked a little like this,
Endless examples of perfection and bliss:
kunanyi's slopes housed a spectacular sight,
An alpine rainforest, full of delight.

A rich tapestry of eucalypt trees,
Of white lichen on rock, so high above the sea.
Crystal-clear creeks, and beautiful North West Bay River,
The mountain's snow-fed springs always deliver.

2. Ecosystem connections

Draw lines to connect each ecosystem element with its correct description:

Element	Description
Alpine rainforest	White, crusty growth often found on rocks
Eucalypt trees	Cold-climate forest found on mountain slopes
White lichen	Iconic Australian trees with distinctive leaves
Snow-fed springs	Water sources originating from melted snow

3. Reflection

Write 2-3 sentences about why you think kunanyi/Mount Wellington's ecosystem is unique and important.

Question 16:

- Display Question 16 and work as a class to complete the drag and drop.
- Using their favourite ideas from the brainstorm in Question 14, students research similar successful campaigns or signage used in other protected areas. They also gather information about the Disappearing Tarn's ecosystem and why swimming is harmful.

Extension opportunity: Create a visual mock-up of their idea. This could be:

a) A detailed sketch of a sign or information board

b) A storyboard for a short educational video

c) A layout for a brochure or information leaflet

d) A prototype of a mobile app interface

Question 17:

- Display Question 17. Students complete the question independently or as a class.
- Divide the class into small groups. Give each group 5 minutes to brainstorm or research real-world examples of environmental damage in their local area or from recent news. For each example, they should:
- Identify a specific environmental issue
- Explain how they would assess the damage
- Describe how they might compare the current state to past conditions
- Suggest a plan to address the issue
- After 5 minutes, have groups quickly share their findings with the class.

Question 18:

- Display Question 18 and complete as a class.
- Students will research the Palawa Kani name for their local area or a chosen area in the state. What is the name, and why was this name given to the location?

Challenge question revisited – Chapter 2

Sample answer:

Paddy discovered pollution in the rivers and creeks on kunanyi/Mount Wellington. How might the pollution affect the drinking water?

The water will be contaminated, more difficult to clean, be aesthetically off-putting, and potentially unsafe.

Lesson 3 (Questions 19-26)

The teacher will read Chapter 3 of 'The Water Guardians: city river rescue' in its entirety to students prior to beginning Lesson 3.

Challenge question – Chapter 3

Ask the following questions, record students' responses and then take opportunities throughout the lesson to 'check in' with students. Are they able to use their new knowledge to confirm, add to, or alter their responses?

Our water guardians' journey from the city to kunanyi/Mount Wellington showed the impacts on the waterways in the environment as a result of human behaviours.

How might observing these changes help us understand and address environmental issues better? What can we do to take better care of our waterways, avoid wasting water, and encourage others to do the same?

Question 19:

- Display Question 19 and click on the hotspots to reveal locations where pollution might occur.
- Pose this question to the class: 'Of all the pollution sources we've identified, which do you think poses the greatest threat to the Derwent River's health, and why?'

Question 20:

- Ask students to select one organisation from the following:
  - Hydro Tasmania
  - TasWater
  - Environment Protection Authority
  - or find another local organisation in Tasmania that might have something to do with water management (NRM, NRE, Tamar Estuary programs, Derwent Estuary Program etc.)

- Visit their website and navigate to their 'About us' section to learn their role in water management. Share findings with the class.
- Display Question 20 and complete as a class.

Question 21:

- Display Question 21. Students complete the activity independently or as a class.
- **Water conservation podcast promo**

Setup

- Display a list of water conservation awareness strategies (e.g. aerial display, morning tea, erecting signs) and their purposes (e.g. attract attention, gather community, educate visitors) on a board or screen.
- Divide the class into small groups of 3-4 students.

Activity

- Announce: 'You're Flynn's podcast team! Create a 30-second promo for a podcast episode about water conservation strategies.'
- Groups choose a strategy and its purpose from the displayed list or make up your own.
- Students have 10 minutes to brainstorm and prepare their podcast promo, including:
  - A catchy podcast title
  - A brief description of the episode's content
  - A teaser about why listeners should tune in

Performance

One group performs their 30-second podcast promo for the class, mimicking a radio announcer style.

Question 22:

- Display Question 22 and complete as a class.
- Reflecting on your own habits, can you identify any water-wasting behaviours you might have engaged in? What steps can you take to change those behaviours?

Question 23:

- Display Question 23 and complete as a class.

- ## Offline activity 3: Water-wise bathroom audit

Objective: To assess the water efficiency of our school toilets and promote awareness about water conservation.

Materials needed:

- This worksheet
- Clipboard or notepad
- Pen or pencil

Group members:

-
-
-
-

Audit checklist

For each toilet, mark Yes, No, or N/A (not applicable)

Feature	Yes	No	N/A
Has a dual flush system			
Visible signs for proper flushing			
Any visible leaks			
Water-saving aerators on taps			
Automatic or sensor-operated taps			

Observations

Note any additional observations or issues.

Calculations

- Total number of toilets audited
- Number of toilets with dual flush systems
- Percentage of toilets with dual flush systems (Divide answer 2 by answer 1, then multiply by 100)

Discussion questions

- What percentage of toilets have dual flush systems?
- How effective are the current water conservation signs (if any)?
- Did you notice any leaks or other issues?
- What are the most water-efficient features you observed?
- What improvements could be made to save more water?

Action plan

Brainstorm and write down one action your group can take to raise awareness about responsible water use in bathrooms.

Next steps

- Present your findings and action plan to the class
- Discuss how to implement your action plan
- Consider creating posters, organising a Water Conservation Week, or starting a leak reporting campaign

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Question 24:

- Display the slider on Question 24.

- **Word Tennis**

  Students stand in a circle or are seated for participation.

Instructions

1. Explain the game: Introduce Word Tennis, where students alternately say one word or phrase related to the river's transformation, switching between negative (before) and positive (after) aspects.
2. Start the Game: Begin with a prompt like, Name a word describing the 'before' condition. For example, a student might say pollution, followed by another saying clean.
3. Continue alternating words, encouraging quick responses. If a student hesitates for more than 5 seconds, they are out for that round.
4. Encourage creativity: Prompt students to think broadly about aspects like wildlife, community actions, and environmental health. Examples include:
   - Negative: litter
   - Positive: restoration

Question 25:

- View the short clip: Returning the water
- Display Question 25, students will answer independently. Are they able to use the new information to support their answer?

Challenge question revisited – Chapter 3

Sample answer:

How might observing these changes help us understand and address environmental issues better?

If something is changing, especially for the worse, there can be early warning signs that help us intervene or make a change early before things get too damaged.

What can we do to take better care of our waterways, avoid wasting water, and encourage others to do the same?

We could join local land care groups, learn about ways to save water, and invite our friends and family to join us in learning and becoming water guardians in our everyday life.

Post-session quiz

Encourage your class to complete the post-knowledge quiz independently. It is identical to the pre-knowledge quiz, so your students' responses will indicate improvements in their understanding of water conservation, water quality and water for health.

Question	Answer
1. What did Flynn spot at the Derwent River that made him swoop down for a closer look?	**B)** An unusual colour in the river, from overflowing sewage
2. Why were the Water Guardian animals concerned about what all the people were doing at the disappearing tarn?	**C)** Because it is linked to the drinking water supply for Fern Tree residents
3. True or False: The 3Ps that can be flushed down the toilet are: Poo, Pee and (toilet) Paper?	**True**
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6. Which of the following organisations care about water in Tasmania?	**D)** All of the above
7. True or False: When you flush the toilet, the waste (sewage) goes straight into the ocean.	**False**

Post-workshop discussion:

Invite your students to share any interesting or important lessons they have learned from the workshop. Revisit the three challenge questions and student responses. Identify gaps in the students' learning and review the relevant workshop activities if necessary.

At home activity pack

Students are encouraged to continue learning about water literacy at home, with their families. The TasWater at home activity pack is a supporting resource that can be included in newsletters, on school communication apps, or shared on a learning management system (LMS). The at home activity pack shares the key messages that students have learned with their class. It includes conversation starters, and a fun family activity designed to extend water literacy from the classroom into the home.

Additional resources

NRE Tasmania: Get to know the fluctuating flow of your local rivers, track flow data over days and weeks to see how reactive the waterways can be to the weather

Melbourne Water and ABC Education: have partnered to develop some great general Australian water literacy resources. Check out the Story of Water video series.

Hydro Tasmania: Learn how Hydro Tasmania manages water sources and explore their educational resources at Hydro Tasmania.

Bonorong Wildlife Rescue: Tasmania's largest 24/7 Wildlife Rescue Service supports thousands of animals each year. Save their hotline, 0447 264 625, and check out their 'What Can I Do?' section.

Platypus protection: Rubbish can be deadly for wildlife. 'Seize it, Snip it, Bin it!' helps prevent loop trash injuries. Visit Hobart Rivulet Platypus and the Australian Wildlife Society for more.

Wind-proof your bins: Light recycling materials often escape in Tasmania's wind. Some Councils offer free bin latches to prevent spills without affecting collections. Contact your Council or purchase a latch online.

Dark Sky for wildlife: Birds like shearwaters and penguins are disoriented by nighttime light reflections. Learn more about the dark sky movement at Dark Sky Tasmania.

Helping native wildlife: Make your area a haven for wildlife with native plants, water sources, and safe spaces. Find tips at TassieCat and backyard bandicoot tips from the City of Hobart.

NASA water education: For a space-themed view on water's importance, search 'NASA water education' online.

If you have any questions or would like to share your water literacy activity experiences, please feel free to reach out by emailing communityprograms@taswater.com.au or to find out more about your water please visit www.taswater.com.au