

Teacher Support Package

Primary – Stage 1

This package is designed to support teachers by providing links to relevant, quality and engaging educational resources related to the work that WaterNSW does managing the drinking water catchments and dams for Greater Sydney. The selected content, activities and on-line learning tools are aligned with NSW syllabus outcomes as outlined below.

This package may be used as a standalone resource or to enhance an excursion to Warragamba Dam.

Pre-visit

Prior to visiting Warragamba Dam on a school excursion, teachers may choose to introduce new ideas and concepts. This will enable students to connect place-based learning to existing understandings.

Post-visit

Following an excursion to Warragamba Dam, teachers may choose to validate, consolidate, or further extend student understanding.

Resource topics include:

- The water cycle ST1-10ES-S
- What is a catchment? GE1-1
- What is storm water? GE1-2
- Warragamba Dam GE1-1
- Water as a resource GE1-2, ST1-10ES-S
- Healthy water is home to many creatures GE1-2, ST1-4LW-S
- Geographical field sketch GE1-3, ST1WS-S



The following icons have been used to categorise the links:



Websites



Books



Videos



Movement and Singing



Puzzles, Games and Creativity

Visit [waternsw.com.au/education](https://www.waternsw.com.au/education) for more information or to book an excursion.




The Water Cycle



The earth only has a limited amount of water. This water keeps going around and around – from the land to the sky and back again. This journey is called the ‘water cycle’.

We all need clean freshwater to survive. Although about three-quarters of the Earth’s surface is covered with water, less than one percent of this is available for us to use.

When we interrupt the natural water cycle by building dams so that we have clean safe water, this is called the ‘managed water cycle’.



Resources	
	<p>WaterNSW – Water Cycle Information (teacher level)</p> <p>WaterNSW – A4 Water Cycle Factsheet</p> <p>Sydney Water – Outline of the Natural Water Cycle</p> <p>NASA – Water Cycle Board Game</p>
	<p>WaterNSW – How does the water cycle move water around earth? (2:18mins)</p> <p>British MET office – Water Cycle (1:47mins)</p> <p>Dreamtime Stories – Tiddalik The Frog (2:42mins)</p>
	<p>Meg Humphrys – When water lost her way (8:00mins)</p> <ul style="list-style-type: none"> • An Australian story about water • From the 2019 Notable list from the Children's Book Council of Australia • Lost in her ever-changing forms, Water questions who she is after an encounter with a creature in an underground cave. Water seeks all parts of her cycle for answers <p>WaterNSW – Water-themed book list</p> <ul style="list-style-type: none"> • This water-themed book list will help you to find books suitable for exploring all aspects of water, including Australian perspectives.

	<p>Red Cat Reading – Earth's Water (5:57mins)</p> <ul style="list-style-type: none"> • The book explores the different states of water - liquid, gas and solid. It explains how the changes occur • At the end there are some simple experiments you can do at home or in the classroom <p>Yorta Yorta Man and Aboriginal artist Mr Francis Firebrace – How the Great Fish Goodoo Created the Murray River (4:30mins)</p> <p>Picture book – A Drop Around the World by Barbara McKinney</p> <ul style="list-style-type: none"> • Review and Introduction • Worksheet • Read Aloud with Ms Caudle
	<p>Have fun teaching – Water Cycle song (3:41mins)</p> <p>Jack Hartmen – Water Cycle Dance (2:55mins)</p> <p>Bob Schneider – Listen to the Water (4:09mins)</p> <p>Blazer Fresh – Water Cycle Rap (3:16mins)</p> <p>Songs for Teaching</p> <ul style="list-style-type: none"> • A site with many educational songs • Select a song. Lyrics and/or purchase options are available • Many can be viewed on YouTube
	<p>WaterNSW – Water Cycle in a Bag (Hands-on Activity) Introduction video, Conclusion video, Instructions, Results sheet</p> <ul style="list-style-type: none"> • You can make it rain in a bag! These videos and worksheets show you how to create a water cycle in the bag. <p>WaterNSW – Play and learn about the water cycle with Gillie</p> <ul style="list-style-type: none"> • Learn about the water cycle with a printable board game <p>South East Water – Water Cycle Game</p> <ul style="list-style-type: none"> • In this fun, interactive game, students learn about the role of temperature in the water cycle. <p>Legends of Learning – Water Cycle</p> <ul style="list-style-type: none"> • Interactive games that help students understand changes of state in the water cycle

What is a catchment?




A catchment is an area where water is collected by the natural landscape.

Imagine cupping your hands in a downpour of rain and collecting water in them. Your hands have become a catchment.

The outside edge of a catchment is always the highest point. Gravity causes all rain and run-off in the catchment to run downhill where it naturally collects in creeks, rivers, lakes, or oceans.

Rain falling outside the edge of one catchment is falling on a different catchment and will flow into other creeks and rivers.



Resources	
	<p>Australian Environmental Education – What is a catchment?</p> <p>WaterNSW – Catchment information</p> <p>WaterNSW – Special Areas</p> <ul style="list-style-type: none"> Special Areas are zones that protect Greater Sydney's drinking water catchment
	<p>WaterNSW – Protecting the Heart of the Catchment (4:17mins)</p> <p>Buladerang – A Wiradjuri Creation Story of where two catchments meet (4:53mins)</p> <ul style="list-style-type: none"> Sharon Riley, a Wiradjuri woman, tells the story of Gaygar and Biladurang on the River Lett (near Lithgow).
	<p>WaterNSW – Learn with Shellby: What is a catchment?</p> <ul style="list-style-type: none"> Students think about the activities that happen in their catchment, how those activities impact their catchment, and actions they can take to keep their catchment healthy. <p>WaterNSW – Our Changing Catchment Video & Activity Worksheet</p> <ul style="list-style-type: none"> Students build a model of a catchment and investigate weather, erosion and turbidity <p>Junior Landcare – Catchment Management: The Story of a River</p> <ul style="list-style-type: none"> Students investigate how land uses impact water quality and how to remove pollutants from water.





What is storm water?

Stormwater is rainwater plus anything the rain carries along with it. As rainwater runs across different surfaces, it can pick up various types of pollutants.

WaterNSW works with councils to reduce pollution in storm water. This means there is less impact on water supply.

After studying the concept of storm water, students can look at the school and playground and discuss where the water goes when it rains. Are there any problems? Is the school doing a good job of managing storm water to keep the environment and waterways clean? How many drains are there? Can you see rubbish in the drain when you look through the grate?



Resources	
	<p>Washington Department of Ecology – Stormwater Information</p> <p>Australian Government – Stormwater Information (Teacher level)</p> <p>Sydney Water – Stormwater Audit</p> <ul style="list-style-type: none"> Higher than Stage 1 level, but may assist you in developing a simple audit
	<p>NCTCOG E&D – Freddy the Fish (4:28mins)</p> <ul style="list-style-type: none"> Explores what stormwater is and what should be allowed down the drain <p>CWEP – Introduction to Stormwater Runoff (2:57mins)</p>
	<p>The drain is just for rain (2:34mins)</p> <ul style="list-style-type: none"> An earworm that reinforces that drains are just for rain <p>Banana Slug String Band – Storm Drain Blues (3:47mins)</p>
	<p>Education Services Australia - Old Bernie's Pond Game</p> <ul style="list-style-type: none"> Clean up the rubbish and weeds to make a clean pond (Flash player)



Warragamba Dam

Located about 65 kilometres west of Sydney in a narrow gorge on the Warragamba River, Warragamba Dam is one of the largest domestic water supply dams in the world.

Created by damming Warragamba River and flooding the Burratorang Valley, the storage lake is four times the size of Sydney Harbour and stores up to 80 percent of Sydney's water. Warragamba Dam supplies water to more than 5 million people living in Sydney and the lower Blue Mountains.

The best quality water is selected and drawn through screens on three outlets in the upstream face of the dam. Water flows by gravity through a valve house into two pipelines that feed the raw water to Prospect water filtration plant and via off-takes to smaller filtration plants at Orchard Hills and Warragamba.








Resources	
	<p>WaterNSW – Visiting Warragamba Dam and related information</p> <p>WaterNSW – Greater Sydney Dam Levels</p> <ul style="list-style-type: none"> Discover how much water is in Sydney Dams by using this interactive map <p>WaterNSW – Water Insights</p> <ul style="list-style-type: none"> Explore how much water is available in each water supply across the state via an interactive state map
	<p>WaterNSW – Warragamba – A story of our making (21:31mins)</p> <ul style="list-style-type: none"> Generations of Sydneysiders owe thanks to the 2000 workers who worked round-the-clock shifts to build Warragamba Dam between 1948 and 1960. This is their story told by the men and women who lived and worked at Warragamba. <p>WaterNSW – 2012 Warragamba Dam spilling video footage (2:27mins)</p> <p>WaterNSW – How the gates on Warragamba Dam work (2:10mins)</p> <p>WaterNSW – Caring for the Quiet Beast (4:54mins)</p>

Water as a resource

Water is a precious, natural resource that supports all human, plant, and animal life. We use it to grow food and make goods. Water supports life.

Australia is the driest, permanently inhabited continent, and our frequent droughts and long periods of hot, dry weather make water an even more valuable resource. We store more water per person than any other country, to make sure we have enough during times of drought.

When our dams are full, WaterNSW stores over 500,000 litres (half a megalitre) of fresh water for every person in the Greater Sydney area. However, our growing population and variable climate mean that saving water makes good sense.

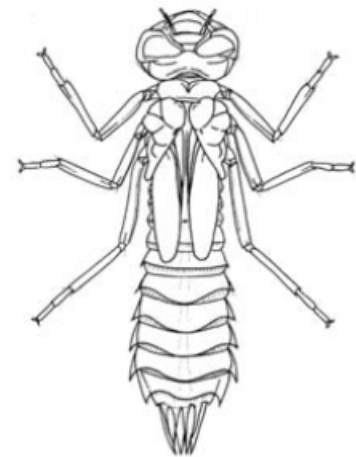
Resources	
	<p>WaterNSW – A Precious Resource</p> <ul style="list-style-type: none"> Balancing competing human and environmental demands for water is a critical global issue.
	<p>Gapuwiyak – The Water Song (2:41mins)</p> <ul style="list-style-type: none"> An Indigenous perspective sung in a mix of Djambarrpuyngu language and English by children in Gapuwiyak Arnhem Land <p>Sesame Street – The Water Song" (1:27mins)</p> <p>WaterNSW – How WaterNSW supplies water to Greater Sydney (3:12mins)</p>
	<p>South Australia Water – Captain Plop</p> <ul style="list-style-type: none"> A downloadable PDF in the series Captain Plops Tour De recycle for a parent or teacher to read aloud
	<p>Halls Creek Community in the Kimberly – Don't waste the water (4:02mins)</p> <p>Singapore's National Water Agency – Let's Go Save Water (1:20mins)</p>
	<p>WaterNSW – Learn with Shellby: Water at home</p> <p>ClickView – Water: A Precious Resource (13:00mins)</p> <p>United States Environmental Protection Agency – Safe Water</p> <ul style="list-style-type: none"> This site has numerous resources from colouring in to find-a-word activities <p>WaterAid – Germ Zapper game</p> <ul style="list-style-type: none"> Key message is that washing our hands, protects us from germs <p>Arizona USA, Water Use it Wisely campaign – Interactive games</p>

Healthy water is home to many creatures



Rivers, streams and dams are a hidden world full of life and diversity. Sheltered bays and shallow inlets, where creeks and rivers flow into the lake, are an ideal habitat for native animals such as turtles, platypus, and water rats.




WaterNSW scientists use the study of aquatic life as bioindicators of potential issues. A change in the health and numbers of aquatic life could tell us that there is a change in water quality. By studying these changes, we can better understand where we need to put measures in place to stop potential pollutants from traveling into the water supply. Populations of macroinvertebrates or “water bugs” are studied on an ongoing basis.

Macroinvertebrates are creatures without backbones that you don't need a microscope to see. An example is the dragonfly larvae picture to the right.



Macroinvertebrates are usually abundant and diverse when water quality is good, but they are sensitive to deteriorating water quality and habitat condition, and to changes in water flow.

Resources	
	National Geographic Kids – Freshwater Habitat
	<p>Melbourne Water – Water Bugs (3:13mins)</p> <p>ABC Science Program Catalyst – Eel Migration (5:13mins)</p> <ul style="list-style-type: none"> • Epic story of eels travelling thousands of kilometres to breed <p>ABC Education – Lives of Platypuses (4:17mins)</p> <p>Deep Look – Water Strider Video (3:33mins)</p> <ul style="list-style-type: none"> • Insect Hunters that walk on water <p>The Secrets of Nature – Sky Hunters World of the Dragonfly (49:48mins)</p> <ul style="list-style-type: none"> • An excellent dragonfly documentary with vivid closeups <p>National Geographic – Freshwater shrimp clean the water (3:45mins)</p> <ul style="list-style-type: none"> • In this short film by Freshwaters Illustrated, dive into a busy tropical stream ecosystem and learn how shrimp, crabs, and other invertebrates are creating a nutrient-rich environment for wildlife to flourish and humans to enjoy.

	<p>NSW Water watch – Water Bug ID Charts and posters</p> <p>Melbourne Water – Puddles the Platypus story and activities</p> <p>Aunty Gloria Whalan – Guulaangga, the Green Tree Frog (2:51mins)</p> <ul style="list-style-type: none"> Gloria is an elder of the Morwell community, though she grew up in Lithgow, NSW. Her people are the Wiradjuri, from around the Blue Mountains in NSW. This story is inspired by Gloria's experiences growing up on a farm. Her grandmother taught her to appreciate all creatures great and small, and their place in the natural environment. The story is in English and Wiradjuri.
	<p>Peter Combes - "Tadpole Blues" (3:12mins)</p> <ul style="list-style-type: none"> Explores the lifecycle of a frog
	<p>Australian Museum – Frog ID project</p> <p>National Water Bug Blitz – Get involved and meet the bugs</p> <p>WaterNSW – Select from a range of engaging printable activities</p> <ul style="list-style-type: none"> Fish (Simple colouring) Goola (Cormorant) (Simple colouring) Platypus (Complex colouring) Water rat (Complex colouring) Crayfish (Mirror-a-bug) Snail (Enlarge-a-bug) Tangled eels (Colour and count) River scene (Colour, Puzzle, Cut-and-Paste) Long-necked turtle (Activity Choice Board) <p>Melbourne Water - Puzzling Platypus</p> <ul style="list-style-type: none"> A printable maze for the platypus to find her babies <p>Melbourne Water – Water creature colouring-in</p>

Geographical Field Sketch

A field sketch provides an opportunity for students to contextualise the features of, and activities that are happening in the environment they are studying.

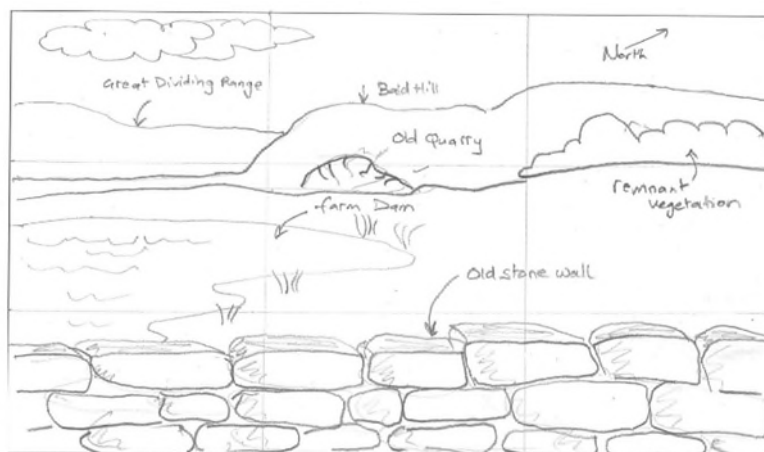
Field sketches are useful to record, highlight and annotate key features of the place being observed.

A field sketch is judged on its ability to convey information, not judged on its artistic merit. This means annotations and labels are an important part.

Steps to draw a field sketch:

- Divide the page into thirds with a light pencil line
- Draw the horizon
- Add important large features
- Draw the foreground & closest things last
- Use shading to give depth
- Which way are you looking?
- Label features e.g. mountain names

Hint: Always draw the background or horizon first. Don't forget the clouds and what is happening in the sky.



Resources



[Click here for more information on field sketching](#)