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Water Educator's Toolkit

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Water educator's toolkit

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Introduction

Australia is a dry continent with a highly variable climate. While it generally receives significant rainfall and is well-endowed with groundwater resources, these water sources occur in northern and central Australia rather than in southern areas where it is most needed for agriculture and urban supplies. Understanding the complex story of water in Australia is critical for students making future informed decisions about managing our water resources sustainably.

The implementation of the Australian Curriculum (Foundation-Year 10)¹ provides a valuable opportunity for water educators to share ideas and activities. The subject areas of Science, Geography and History are particularly relevant water education topics.

In 2015, changes were made to the Australian Curriculum: F – 10 in response to the 2014 Review of the Australian Curriculum—particularly in the Humanities learning area. These changes are reflected in the v8.2 F-10 Curriculum and references to specific content descriptions have been updated. The Australian Curriculum review addressed concerns about the volume of material expected to be covered in the primary years by replacing Geography, History, Civics and Citizenship and Business subjects with a single Foundation – Years 6/7 Humanities and Social Sciences (HASS) learning area. The information provided below has been updated to using the v8.2 Australian Curriculum for the HASS learning area Years F-6/7 and the Geography subject for Years 7-10.

The purpose of this toolkit is to collate 'tried and tested' activities in a Water Education Toolkit to assist water educators—particularly novice water educators—to develop student and teacher understanding about their local water story. With the help of experienced members from the [AWA Water Education Network](#)², the toolkit will provide engaging, hands-on and experiential learning activities that can be used in face-to-face contexts with students and the public.

The most enduring water education activities have been modified many times and the toolkit provides ideas for adapting activities including activities for site tours and classroom incursions. Many of the activities are drawn from excellent existing resources such as 'Water – learn it. live it.' published by Victorian water educators.

The Australian Curriculum links are highlighted for each activity. The Australian Curriculum content descriptions show the year level in which a particular concept is assessed. For instance, students need to demonstrate the quality of their understanding about the water cycle in Year 7. However, it is important that students are exposed to these foundational water concepts informally as early as possible so that by the year the concept is assessed (i.e. Year 7 in the case of the water cycle), students have a mature understanding of the concept. Simple explanations and explorations of the water cycle should be introduced from the Foundation year or earlier.

¹ Australian Curriculum F-10 v8.2 © Australian Curriculum, Assessment and Reporting Authority (ACARA) 2010 to present, unless otherwise indicated. This material was downloaded from the Australian Curriculum website (<http://www.australiancurriculum.edu.au/>) accessed 2 August 2016 and was not modified. The material is licensed under CC BY 4.0. Version updates are tracked on the Curriculum version history page of the Australian Curriculum website. ACARA does not endorse any product that uses the Australian Curriculum or make any representations as to the quality of such products. Any product that uses material published on this website should not be taken to be affiliated with ACARA or have the sponsorship or approval of ACARA. It is up to each person to make their own assessment of the product, taking into account matters including, but not limited to, the version number and the degree to which the materials align with the content descriptions (where relevant). Where there is a claim of alignment, it is important to check that the materials align with the content descriptions (endorsed by all education Ministers), not the elaborations (examples provided by ACARA).

² Information about the AWA Water Education Network can be accessed from http://www.awa.asn.au/AWA_MBRR/Communities/_Specialist_Networks/_WEN/WEN.aspx

The activities are organised in the following overlapping water topic areas:

- Natural water cycle
- Catchments and waterway health
- Water sources
- Water treatment—drinking water
- Water treatment—wastewater treatment
- Water management
- Water uses
- Using water wisely
- Water careers

The activities are categorised as:

- Lesson
- Game
- Hands-on activity
- Demonstration
- On-site tour activity
- Incursion
- Excursion
- Take-home activity
- Event

1 Natural water cycle

1.1 [A drop in the bucket](#)³

Demonstration

This activity explores the global distribution of water with a focus on the availability of freshwater resources and is very useful for introducing a discussion about why it is important to use water wisely. There are a number of different approaches to this activity depending on your focus. For instance, it can be adapted to highlight the importance of sustainably managing our groundwater resources.

This demonstration starts with a 1000 mL beaker of coloured water. You remove 30 mL representing the 3% of freshwater on Earth and add salt to the remaining water in the beaker to represent the proportion of salt water etc.

Variations

In the '[Water – learn it. live it. version](#)⁴', students begin by playing a game of 'Toss the globe' to estimate 'Where in the world is water'. They then predict the amount of water that might represent fresh drinking water, icecaps and glaciers, salt water and groundwater. Students then research the actual answers.

Year levels: Year 7 but suitable for all year levels

Key curriculum links: Year 7 Science (ACSSU116); Year 7 HASS Year 7 Geography (ACHGK037; ACHGK039)

1.2 [Water cycle dice game](#)⁵

Game

In this activity students roll dice at different 'water cycle' stations (e.g. clouds, animal, soil, ocean, river) around the classroom to explore how water moves through the environment. They can also identify what states of water (liquid, solid or gas) might be involved as the water moves to different stations (Year 5). As students move from station to station they collect trackers (coloured beads or strips of coloured paper) to indicate which stations they moved through.

Variations

This game can be played successfully with ordinary dice. Students can also track their progress through the stations using a worksheet which lists the stations.

Year level/s: Years 5 and 7 but also suitable for Years 3-6

Key curriculum link/s: Year 5 Science (ACSSU077); Year 7 Science (ACSSU116); Year 7 HASS (ACHASSK182; ACHASSK184); Year 7 Geography (ACHGK037; ACHGK038)

1.3 [Climbing water](#)⁶

Hands-on activity

³ LandLearn (2007) *A drop in the bucket* <<http://www.landlearn.net.au/newsletter/2004term2/page2.htm>>

⁴ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 43. <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

⁵ Arctic Climate Modeling Program (2008) *The water cycle game* <http://www.arcticclimatemodeling.org/lessons/acmp/acmp_k4_WaterCycle_WaterCycleGame.pdf>

⁶ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 14. <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

This simple but effective activity in Volume 1: Water in the Natural Environment demonstrates capillary action during transpiration. You will need a few white carnations with the stems cut at a 45° angle, jars, water and food dye. Students watch the carnations turn from white to colour by adding food dye to the water and cutting and observing the flowers over a few days.

Variations

Students can chart the changes in their flowers at hourly (or other) intervals and include hand drawn pictures or photographs. They can also change variables such as adding salt and coloured water to one jar and just coloured water to another.

Year level/s: Suitable for all year levels

Key curriculum link/s: Year 5 Science (ACSSU043); Year 7 Science (ACSSU116)

1.4 [Water cycle in a jar](#)⁷

Hands-on activity

This activity in Volume 1: Water in the Natural Environment shows students how the water cycle works up close. You will need a jar, rocks, soil, sand, a small plant or seedling and a soft drink bottle cap. Students create their own terrarium in the jar by layering the rocks, soil and sand. They then plant the small plant or seedling in the middle. Fill the soft drink bottle cap with water and place it next to the plant. Put on the jar lid and place the terrarium in a sunny position to watch the water cycle at work.

Year level/s: Year 7 but suitable for all year levels

Key curriculum link/s: Year 7 Science (ACSSU116)

1.5 [The water cycle silent card shuffle](#)⁸

Game

In small groups, students use a set of cards with labelled images of the following: mountains, condensation (clouds), rivers and lakes, sun, ocean, evaporation (gas), infiltration (groundwater), transpiration from plants and run-off (surface water). Without talking, students sort the cards into the order they think is the water cycle. They can only use actions to communicate and all members of the team should contribute. Allow time for students to discuss amongst their group and share with the class. This activity can be found in the Water Cycle Activity - Teacher Information (Activity 2).

Year level/s: Years 5 and 7 Science but suitable for most year levels

Key curriculum link/s: Year 5 Science (ACSSU077); Year 7 Science (ACSSU116)

1.6 [Perspiring trees](#)⁹

Incursion

⁷ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 26

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

⁸ North East Water, *Water cycle activity* teacher information worksheets, p. 4 <<http://newwater.com.au/learning-centre/education-schools-early-childhood/teacher-resources.asp>>

⁹ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 28

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

You can demonstrate transpiration in trees with this simple experiment in the 'Where else is water' activity in Volume 1: Water in the Natural Environment. This activity needs to be set up one day and left overnight to observe the next day. Select three different trees within the school grounds and place plastic bags over a large bunch of the leaves on each tree. Seal the end of the bag with masking tape or tightly tied string. In the morning, collect the bags then observe and measure the contents. Students can make notes and/or graph their results.

Year level/s: Years 5 and 7 but also suitable for Years 3, 4 and 6

Key curriculum link/s: Year 5 Science (ACSSU043); Year 7 Science (ACSSU116)

1.7 [Being the water cycle](#)¹⁰

Lesson

In this drama lesson found in Volume 1: Water in the Natural Environment, students act out, mime, dance or create a short film about the water cycle. You could provide them with some cards with pictures and words of the following water cycle stages: precipitation, infiltration, transpiration, evaporation, condensation. Or these images could be displayed on the whiteboard or classroom wall.

Variations

Use a storyboard template to plan a short film and use movie making software to collate the final product.

Year level/s: Year 7 but suitable for most year levels

Key curriculum link/s: Year 3 Science (ACSSU046); Year 7 Science (ACSSU116)

1.8 [Climate changing](#)¹¹

Lesson

This activity in Volume 1: Water in the Natural Environment requires some prior research by students. They create a set of interview questions for an older friend or relative about how they have noticed their local climate changing over time. Students reflect on the most interesting thing they learnt. They could create a PowerPoint presentation about their findings or write an article including quotes and images.

Year level/s: Year 2, and 5 but suitable for most year levels

Key curriculum link/s: Year 2 History (ACHASSK044); Year 5 HASS (ACHASSK113)

1.9 [Condensation and rainfall records](#)¹²

Demonstration

This simple activity in Volume 1: Water in the Natural Environment demonstrates condensation. You will need a glass jar with a metal lid, a dark coloured non-

¹⁰ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 32

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

¹¹ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 64

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

¹² Water learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 66

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

permanent marker pen and a hammer and nail. Make five indentations in the top of the jar lid, being careful not to punch through the lid. Colour in the underside of the lid with the marker pen. Fill the jar almost to the top with boiling water and place the lid upside down on top of the jar, making sure none of the gas escapes.

Variations

The [Water: learn it for life¹³ version](#) extends this activity with students making their own rain gauge and charting the rainfall in their area.

Year level/s: Years 3-7

Key curriculum link/s: Year 3 Science (ACSSU046); Year 5 Science (ACSSU077)

1.10 [Wet and dry Australia](#)¹⁴

Lesson

Australia is made up of six climate zones: Equatorial, Tropical, Subtropical, Desert, Grassland and Temperate. Each zone varies in its rainfall and temperature. As a group, discuss the climate zone you live in (a quick search on the [Australian Government website](#)¹⁵ will give you your climate zone). By understanding climate, we can choose an appropriate holiday destination, plant the right crops and ensure our homes are designed for long-term comfort and durability. Brainstorm ways that climate (such as hot and humid or freezing cold) might change the way a person lives. Think about clothing, housing, activities and hobbies, food and travel. Create a collage or map to indicate the different climate zones in Australia. This activity can be found in Volume 1: Water in the Natural Environment.

Variations

Younger students can collect images and group them into wet and dry then make a collage on A3 paper. Older students can create maps to show the climate zones around Australia.

Year level/s: Year 3 but suitable for all year levels

Key curriculum link/s: Year 3 Geography (ACHASSK068)

1.11 [Build a mini water cycle](#)¹⁶

Hands-on activity or demonstration

Students will build their own mini version of the water cycle in this activity.

Equipment: a large clear glass bowl or ice-cream container, a mug, cling wrap, small weight (rock or stone), water, food colouring, [The Water Cycle poster](#).¹⁷

¹³ Queensland Government: Water: Learn it for life (2013) *Year 2 Science: Are we living sustainably?* p. 12 <<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/44e02f7f-3a91-4c27-aa93-7bab7f491a8b>>

¹⁴ Water – learn it, live it. (2013) *Volume 1 Water in the natural environment* p. 70

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

¹⁵ Australian Government (2013) *Australian weather and seasons* <<http://www.australia.gov.au/about-australia/australian-story/austn-weather-and-the-seasons>>

¹⁶ Water Corporation (WA) (2013) *Build a mini water cycle lesson plan*

<<http://www.watercorporation.com.au/home/education/teaching-resources/find-a-lesson-plan/lesson-plan/build-a-mini-water-cycle>>

¹⁷ Water Corporation (WA), *Water Cycle poster*

<<http://www.watercorporation.com.au/home/teachers/lesson-plans-and-teaching-resources/videos-music-and-posters>>

Other water agencies have similar posters. Please refer to the Resources list.

Pour warm water into the bottom of a large glass bowl or ice-cream container. Food colouring can be added for extra effect. Place a dry cup or mug in the centre of the bowl. Cover the top of the bowl with cling wrap so there are no gaps. Don't pull it too tightly. Place a small weight in the centre of the cling wrap so the film sags in the middle. Place the bowl in direct sunlight and leave it for a few hours. Water evaporates from the bowl, condenses on the cling wrap and trickles to a point directly above a mug, imitating evaporation, condensation and precipitation.

Variations

Refer to Activity 3.4 'Desalination' for a different context for this activity.

Year level/s: Years 3, 5 and 7

Key curriculum link/s: Year 3 Science (ACSSU046); Year 5 Science (ACSSU077); Year 7 Science (ACSSU116)

2 Catchments and waterway health

2.1 [Story of a river](#)¹⁸

Hands-on activity

This activity (Resource 11) is designed to highlight the idea that all land uses and human activities in a catchment impact in some way on the quality of waterways in that catchment. The activity can be used to teach students about their local catchment or it can highlight water quality and treatment (by showing what needs to be removed when treating water for drinking). Labels and the story are provided online and can be printed for use. You will also need a large clear plastic container filled with clean water (around five litre capacity) and 12 small plastic containers.

Read the story and pause at the points that something is added to the 'river' (the large container of water). For example, when the river flows through a national park and then through a forest, students add the contents of the containers labelled 'forest'. This contains tea and mulch. When the river flows through an area where someone is fishing on the banks, students add the contents of the containers labelled 'fishing.' This contains tangled fishing line. Once the story is finished and all of the contaminants have been added, the river (and everything else along with it) flows out to sea.

Variations

Discuss the impacts each contaminant might have on the river, the ocean and our drinking water supply. Students can research their catchment and write their local story of a river.

There are many versions of this activity including the [Danny the Drip story pack](#)¹⁹. The original version of 'Story of a river' was adapted from 'Who polluted the Potomac?' developed by the US-based Alice Ferguson Foundation in the early 1990s.

Year level/s: Suitable for all year levels

Key curriculum link/s: Year 4 Science (ACSSU073); Year 6 Science (ACSSU094); Year 4 HASS (ACHASSK090); Year 7 HASS (ACHASSK183); Year 7 Geography (ACHGK038); Year 8 Geography (ACKGH051); Year 10 Geography (ACHGK070)

2.2 [Healthy catchment game](#)²⁰

Game

This team game is designed to reinforce the concept of a healthy catchment. Students think about the types of items that should and should not be found within their local waterways. In teams, students take pictures of items that you might find in a catchment from the 'nest' hoop and place it in one of two hoops—a smiley face or a frownie face. The smiley face means a happy catchment and a

¹⁸ Queensland Government: Water: Learn it for life! (2014) *Year 4 Science: Are we living sustainably?* Resource 11, p. 44
<<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/70f4728e-a187-49a1-adfe-631e25a94ce8>>

¹⁹ Natural Resources—Adelaide and Mt Lofty Ranges *Danny the drip story pack*
<<http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/about-us/our-regions-progress/monitoring-and-evaluation/schools>> It can be found on their 'School monitoring' page under 'Freshwater quality—Resources'.

²⁰ Water: Learn it for life (2014) *Year 4 Science: Are we living sustainably?* Resource 12, p. 48
<<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/70f4728e-a187-49a1-adfe-631e25a94ce8>>

frownie face means the item should not be in there. For example, a picture of a fish goes from the 'nest' hoop into the smiley face hoop but a picture of a plastic bag goes from the 'nest' hoop into the frownie face hoop. This game is explained in Resource 12 of the 'Are we living sustainably?' unit.

Variations

This game can be used as an introduction or reflection tool and can be modified depending on the students' year level and level of knowledge. It can be a race or simply a discussion starter. For younger students, it could be turned into a fishing game by putting paper clips on each item and fishing for them with a magnetic fishing rod.

Year level/s: Years F, 1, 3, 4

Key curriculum link/s: Year Foundation Science (ACSSU002); Year 1 Science (ACSSU211); Year 3 Science (ACSSU044); Year 4 Science (ACSSU073)

2.3 Water quality monitoring and macroinvertebrate sampling

Excursion

Students investigate the health of a waterway by testing a range of water quality parameters or sampling the macroinvertebrates (waterbugs). There are a number of Waterwatch/Streamwatch resources available online, examples of which are listed below. Seek out resources in your region. They can be published by local councils, water utilities, regional natural resource management agencies or state government departments.

The [Waterway health check](#)²¹ provides an introductory qualitative assessment tool for Years 4 to Year 12—depending on the purpose of the activity.

[Streamwatch](#)²² provide water monitoring information for students.

[Natural Resources-Adelaide and Mt Lofty Ranges](#)²³ have an extensive range of resources for waterway monitoring which have been linked to the Australian Curriculum.

The [Up a dry gully](#)²⁴ website provides introductory waterway monitoring activity books for students.

The [Healthy Waterways Waterwatch Program](#)²⁵ provides a useful fact sheet and safety checklist before sampling.

A waterbug dip netting exercise shows students what lives in a particular river or waterway. There are various guidebooks to identify different waterbugs and show their level of pollution tolerance. Equipment can include dip nets, ice cube trays, buckets, pipettes, petri dishes and magnifying lenses. Find a suitable stretch of river and either let students dip in their own nets or collect one large sample with a net and bucket. Students examine the tiny waterbugs in the sample through magnifying lenses or separate larger bugs into segments in the ice cube trays.

²¹ Waterwatch Australia (2002) *Waterway health check*. Commonwealth of Australia
<<http://nrmonline.nrm.gov.au/catalog/mql:2879>>

²² Australian Museum and Sydney Water (2016) *Streamwatch* <<http://australianmuseum.net.au/streamwatch>>

²³ Natural Resources-Adelaide and Mt Lofty Ranges (2016) *For educators: Water*
<<http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/education/for-educators/water>> They can be found in the 'Linking the Australian Curriculum with NRM Education resources' documents for Foundation to Year 2, Years 3-6 and Years 7-10.

²⁴ Seqwater (2016) *Up a dry gully* <<http://upadrygully.com.au/content/activity-sheets>>

²⁵ Healthy Waterways (2012) *Waterwatch Program: Safety*
<<http://www.waterwatchmelbourne.org.au/content/safety/safety.asp>>

Students return the water and waterbugs to the river or waterway when they're finished.

Variations

If there is a stream nearby or the school has a wetland area, you could collect a sample in a bucket for the class and do this activity in the classroom. When the students have finished, the sample can be returned to the wetland area.

Year level/s: Suitable for all year levels

Key curriculum link/s: Year 1 Science (ACSSU211); Year 3 Science (ACSSU044); Year 4 Science (ACSSU073); Year 5 Science (ACSSU043); Year 7 Science (ACSSU111); Year 9 Science (ACSSU176); Year 4 HASS (ACHASSK088); Year 7 HASS (ACHASSK190); Year 7 Geography (ACHGK045); Year 10 Geography (ACHGK073, ACHGK074, ACHGK075)

2.4 Catchments—the journey begins²⁶

Demonstration or hands-on activity

A miniature catchment can be made using a mound of soil, sand and gravel. This activity is explained in the 'From catchment to tap' unit. Four or five buckets will make a decent catchment area. Pile up some high areas to form hills and mountains and dig some trenches and holes to create rivers, ponds and lakes. Using a watering can, demonstrate rainfall and its effects on the simulated catchment area. Discuss the water's behaviour as it flows. Is all the water flowing down the side of the mound? If not, where is it going? What does this tell us about rainfall and our ability to catch it for human use?

Discuss the effects rain has on a catchment as you simulate light showers and heavy storms. Create an impression in the soil to simulate a dam and discuss the behaviour of the flow and how it changes. Add a section of turf or plants to the mound to illustrate the effects they have on water flows and erosion.

Variations

The Water – learn it. live it. version²⁷ suggests covering your landscape with a tarpaulin or large plastic sheet and weighing down the edges with some heavy rocks before pouring water over it. This activity can be found in Volume 1: Water in the Natural Environment.

Year level/s: Years 4, 6 and 7 but suitable for most year levels

Key curriculum link/s: Year 4 Science (ACSSU075); Year 6 Science (ACSSU096); Year 7 HASS (ACHASSK183); Year 7 Geography (ACHGK038)

2.5 Create a catchment²⁸

Hands-on activity

Following the 'Catchments—the journey begins' activity or as a separate indoor activity, students use craft supplies such as icy pole sticks, pipe cleaners, foam, plasticine, glue and paper to create a catchment. A water cycle poster can be

²⁶ Gold Coast City Council Make your water mark! (2012) *From catchment to tap*. Watersaver education program Early stage four, p. 25 <<http://www.goldcoast.qld.gov.au/make-your-water-mark-watersaver-senior-school-kit-13167.html>>

²⁷ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 47 <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

²⁸ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 15 <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

used as a guide (see Resources list). Students can annotate their models with sticky notes that include the most important features then present their models to the class. Refer to Water – learn it. live it. Volume 1: Water in the Natural Environment.

Variations

After the models are complete, students can research the impact/s of removing a single element from their catchment. Who would be impacted and how?

Year level/s: Years 4, 6 and 7 but suitable for most year levels

Key curriculum link/s: Year 4 Science (ACSSU075); Year 6 Science (ACSSU096); Year 7 HASS (ACHASSK183); Year 7 Geography (ACHGK038)

3 Water sources

3.1 [Water storage features](#)²⁹

Hands-on activity

Water can be stored in many different systems. Natural systems include aquifers, oceans, lakes and rivers; man-made systems include rainwater tanks, dams and reservoirs. Students brainstorm all types of water storage systems. Discuss large areas (like reservoirs or the ocean) and small areas (like a rainwater tank). This activity is described in Volume 2 Water in the urban environment.

Variations

Depending on their year level, students can:

- cut out pictures of storage systems and link it to its features
- invent and draw a diagram of their own man-made storage system
- research a variety of storage systems and analyse their benefits in terms of cost, size, environmental impact, source of water, water yield etc.

Year level/s: Year 2 but suitable for most primary year levels

Key curriculum link/s: Year 2 Science (ACSSU032)

3.2 [The catchment crawl](#)³⁰

Excursion

If your water supply reservoir is open and accessible, taking a tour gives students an idea of how far the water has to travel before it reaches their homes. It also shows them how much water is needed to supply cities and towns with drinking water.

This activity is taken from the 'From catchment to tap' section. It provides a worksheet for students to fill in on their way to the reservoir or dam. Students look for water features (farm dams, tanks, creeks, rivers etc.), human influences (agriculture, industry, feral animals, weeds etc.) and natural features (rocky outcrops, roadside vegetation, native plants and animals etc.) then identify what demands these put on the catchment. They list the consequences these influences and features might have for the catchment as a whole.

Variations

The issues could be discussed once students arrive at the reservoir or dam.

Year level/s: Years 4 and 7 but suitable for most upper primary school students

Key curriculum link/s: Year 4 HASS (ACHASSK090); Year 7 HASS (ACHASSK183); Year 7 Geography (ACHGK038)

²⁹ Water – learn it, live it. (2013) *Volume 2 Water in the urban environment* p. 70

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

³⁰ Gold Coast City Council Make your water mark! (2012) *From catchment to tap*. Watersaver education program Early stage four, p. 40 <<http://www.goldcoast.qld.gov.au/make-your-water-mark-watersaver-senior-school-kit-13167.html>>

3.3 [Groundwater replenishment](#)³¹

Lesson

Students watch the videos in the series *Groundwater replenishment*. Following internet research, they have a formal or informal debate about replenishing our groundwater with recycled water that will be used as a drinking water source in the future.

Year level/s: Year 7

Key curriculum link/s: Year 7 Science (ACSHE120)

3.4 [Desalination](#)³²

Hands-on activity

Using beakers, jars, containers, salt water and cling wrap, ask students to design a water desalination plant that will convert salt water into freshwater. If necessary, discuss the elements of the water cycle (In the From Catchment to Tap section).

Variations

The [Water – learn it. live it](#) solar stills activity³³ in Volume 1: Water in the Natural Environment shows salt removal from water by evaporation. Pour salt water into a large container, place a smaller glass beaker in the middle of the water. Cover the container with cling wrap, making sure the seal is tight. Place a weight in the centre of the plastic wrap, suspended over the empty glass. This will assist the water to collect in the glass. Carefully place your construction (called a solar still) in a protected sunny area. Refer to Activity 1.11 'Build a mini water cycle' for a different context for this activity.

Year level/s: Year 7

Key curriculum link/s: Year 7 Science (ACSSU116; ACSSU113)

3.5 [Removing the salt \(or other contaminants\)](#)³⁴

Demonstration

Seawater desalination is a climate-independent water source. There are a number of ways salt can be removed from sea water to produce freshwater. Traditionally, thermal distillation methods were used but the large-scale desalination plants in Australia employ membrane technologies such as reverse osmosis which use much less energy. In reverse osmosis, sea water is forced through a semi-permeable membrane under pressure to separate the water from the salt and other substances.

To demonstrate reverse osmosis, mix a handful of uncooked rice into a bowl of coloured set jelly. The rice represents the salt molecules and the jelly represents water. Place a sieve over the bowl and pour the jelly and rice mixture into the sieve. Use a spoon to put pressure on the mixture and force the jelly through the

³¹ Water Corporation (WA) (2013) *Groundwater replenishment debate* lesson plan <<http://www.watercorporation.com.au/home/education/teaching-resources/find-a-lesson-plan/lesson-plan/groundwater-replenishment-debate>>

³² Gold Coast City Council Make your water mark! (2012) *From catchment to tap*. Watersaver education program Early stage four, p. 33 <<http://www.goldcoast.qld.gov.au/make-your-water-mark-watersaver-senior-school-kit-13167.html>>

³³ Water – learn it. live it. (2013) *Volume 1 Water in the natural environment* p. 29 <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

³⁴ Water – learn it. live it. (2013) *Volume 2 Water in the urban environment* p. 55 <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

sieve. The rice (salt) should stay in the sieve while the jelly (water) gets through. This activity can be found in Volume 2 Water in the urban environment.

Variations

Reverse osmosis membrane treatment is also widely used in wastewater treatment plants to separate water from sewage contaminants. This activity is equally useful in explaining how reverse osmosis works in a water recycling context.

Year level/s: Year 7

Key curriculum link/s: Year 7 Science (ACSSU116; ACSSU113)

3.6 [Recycled water](#)³⁵

Game

Using images of things people do with water (shower, flush the toilet etc.) and a worksheet with two columns labelled 'treated water' and 'recycled water', students match the activity to what can and can't be done with treated recycled water then cut and paste their answers (either in hard copy or on the computer). For example, a picture of brushing teeth should go in the 'treated water' column and a picture of washing a car should go in the 'recycled water' column. Adapt this activity for the types of recycled water used in your area. Note that the answers for this activity will vary from state to state depending on legislation. This activity can be found in Volume 2 Water in the urban environment.

Variations

Students research recycled water and find an interesting example of how it is being used in a real life community. They may find something locally or search for some examples overseas.

This activity could also be adapted to highlight how greywater can be re-used. Again, the legislation and guidelines for the use of greywater will vary from state to state.

Year level/s: Year 7

Key curriculum link/s: Year 7 Science (ACSHE120)

3.7 [Survey on drinking recycled water](#)³⁶

Lesson

Following on from Activity 3.3, students conduct a survey to gauge the school community's attitudes to drinking treated wastewater.

Year level/s: Year 4

Key curriculum link/s: Year 4 HASS Geography (ACHASSK090; ACHASSI074 ; ACHASSI078)

³⁵ Water – learn it. live it. (2013) *Volume 2 Water in the urban environment* p. 49

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

³⁶ Water Corporation (WA) (2013) *Survey on drinking recycled water* lesson plan

<<http://www.watercorporation.com.au/home/education/teaching-resources/find-a-lesson-plan/lesson-plan/would-you-drink-recycled-water>>

4 Water treatment — drinking water

4.1 [Catchment to tap](#)³⁷

Demonstration or hands-on activity

In this demonstration in Volume 2 Water in the urban environment, students watch as different materials are used as a filter for water from the catchment. It can also be done as a hands-on activity with students in small groups. You will need 'dirty' water (you can add things like dirt and leaves), cotton wool, sand, gravel, a hand towel and a two litre plastic soft drink bottle without a lid.

Cut the plastic bottle in half. Turn the top half of the bottle upside down and put it inside the bottom half. Put the hand towel into the plastic bottle and pour the dirty water through it. The hand towel will act as a filter. Students can record their observations on the worksheets provided. Remove the used filter and clean the plastic bottle. Repeat with each different filter (cotton wool, sand and gravel).

Variations

A North East Water³⁸ activity uses compost, food colouring, craft sprinkles, gumnuts, pebbles and pieces of foam to make the water dirty. The filters are paper towels, cotton buds and square wipes. Place all of the filters in together (students choose which order they place them) and pour in the dirty water. Spread the filters out and observe which materials captured which pollutants.

The [Water: learn it for life](#)³⁹ version uses similar materials for filters. However the filters are put into a cup before students can see them then covered up with aluminium foil, creating a mystery filter. The cup also has two or three holes in the bottom for drainage. Pour the dirty water into the mystery filter then discuss what comes out and why this happened. Reveal the mystery filter.

In the [Gold Coast City Council](#)⁴⁰ version (From catchment to tap section), students use charcoal as another option for filtering water and alum (aluminium sulphate) to create floc particles. Ensure that you complete the appropriate risk assessments in accordance with workplace Occupational Health and Safety requirements.

Year level/s: Year 7 but suitable for most year levels

Key curriculum link/s: Year 7 Science (ACSSU113)

³⁷ Water – learn it. live it. (2013) *Volume 2 Water in the urban environment*. p. 33

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

³⁸ North East Water, *Mini water filter treatment activity* teacher information worksheets, contact: education@newater.com.au

³⁹ Queensland Government: Water: Learn it for life (2013) *Year 7 curriculum Science* p. 16
<<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/dafe5929-aa77-4a5b-8c1f-63687df188cd>>

⁴⁰ Gold Coast City Council Make your water mark! (2012) *From catchment to tap*. Watersaver education program Early stage four, p. 30 <<http://www.goldcoast.qld.gov.au/make-your-water-mark-watersaver-senior-school-kit-13167.html>>

4.2 Tour of a treatment plant

On-site tour activity

Many water utilities offer tours of water treatment plants. Different plants have different ways of treating water before it is piped to homes and businesses. Students can see the process in action and visit the many well-equipped visitor centres.

Variations

Many corporations also have virtual tours of their treatment plants and many facts sheets online. Please see the Resources list.

Year level/s: Year 7 and also suitable for older students

Key curriculum link/s: Year 7 Science (ACSSU113; ACSSU116)

5 Water treatment — wastewater

5.1 Tour of wastewater treatment plant

On-site tour activity

Many water utilities offer tours of wastewater treatment or recycled water plants. Different plants have different ways of treating wastewater after it leaves our homes and businesses. Students can see and smell the process in action and visit the many interesting visitor centres.

Variations

Many corporations also have virtual tours of their treatment plants and many facts sheets online. Please see the Resources list.

Year level/s: Year 7 and also suitable for older students

Key curriculum link/s: Year 7 Science (ACSSU113; ACSSU116)

5.2 How we treat wastewater⁴¹

Hands-on activity

This activity asks students to think about how our wastewater is treated before it is released back into the environment. You will need: water, ice-cream containers, cooking oil, detergent, sand, food scraps, sugar, scrap paper, pieces of plastic, matches, cotton buds, combs, kitchen paper (or other absorbent paper) and fine mesh material.

Working in groups, students fill an ice-cream container two-thirds full with water. Add a tablespoon of cooking oil, a tablespoon of detergent, some sand, food scraps, sugar, small pieces of torn paper, plastic, matches and cotton buds. Stir and leave to stand for a few minutes. Students discuss and trial how they will remove the solid material using the comb, kitchen paper and fine mesh material. For example, the comb helps remove bits of plastic and the kitchen paper absorbs the cooking oil. Once removed, what is the water quality like? Students can discuss and share ways the water could be further cleaned.

Year level/s: Years 7 and also suitable for older students

Key curriculum link/s: Year 7 Science (ACSHE120; ACSSU113)

5.3 How degrading—the toilet tissue test⁴²

Hands-on activity

What happens when we flush something down the toilet? The toilet tissue test allows students to see what happens to things that are flushed down the toilet and into the wastewater system. You will need two jars and two different kinds of toilet tissue. Discuss any environmental claims on the packaging, for example recyclable, contains oxygen bleach rather than chlorine bleach. Place each kind of toilet tissue into a separate jar and shake the jar 20 times. Students observe and record what happens. Leave the jars for one week and observe and record again. Students draw conclusions about what type of toilet tissue is the most

⁴¹ Water Corporation (WA) (2013) *How we treat wastewater* lesson plan
<<http://www.watercorporation.com.au/home/education/teaching-resources/find-a-lesson-plan/lesson-plan/how-we-treat-wastewater>>

⁴² Water Corporation (WA) (2012) *How degrading - the toilet tissue test* lesson plan
<<http://www.watercorporation.com.au/home/education/teaching-resources/find-a-lesson-plan/lesson-plan/how-degrading-the-toilet-tissue-test>>

environmentally sound (easiest to treat at a treatment plant). Note: At the treatment plant, materials that stay in larger pieces are best as they are removed in one of the first two screening stages. Small, slushy pieces (and dyes) must be chemically removed.

Variations

Discuss environmental claims on packaging.

Flushable wipes are a product that is also of concern to wastewater treatment plant operators. There are a number of current online media articles to provide a 'real-world' context for this issue and flushable wipes could be added to jars in the hands-on activity above.

Year level/s: Years 6 and 7 but suitable for all year levels

Key curriculum link/s: Year 6 Science (ACSSU095; ACSHE100); Year 7 Science (ACSSU113)

5.4 [What are biosolids?](#)⁴³

Lesson

Biosolids are a by-product of wastewater treatment that can be re-used as a fertiliser. However, what are the considerations/issues around using human waste as a fertiliser? In this lesson, students are asked to research and create a marketing campaign for biosolids as a fertiliser. Part of this will need to outline how to overcome sensitive issues such as health warnings and the 'yuk' factor of human waste.

Year level/s: Year 7

Key curriculum link/s: Year 7 Science (ACSSU116; ACSHE120; ACSHE121;)

⁴³ Water Corporation (WA) (2013) *What are biosolids?* lesson plan
<<http://www.watercorporation.com.au/home/education/teaching-resources/find-a-lesson-plan/lesson-plan/what-are-biosolids>>

6 Water management

6.1 [Water sensitive urban design](#)⁴⁴

Hands-on activity

Water sensitive urban design (WSUD) is a concept that refers to designing and planning urban areas that use water in an environmentally sustainable way. The key principles of WSUD include protecting natural water bodies, directing stormwater, protecting water quality, and reducing run-off.

In this activity in Volume 2 *Water in the urban environment*, students use an online search engine to find out about raingardens. What are they? Why should we use them? Find some instructions on how to plan and build your own raingarden. As a class or in groups, students use the instructions to plan and design a raingarden in their school.

Variations

Walk around the school gardens after a period of heavy rain. Where is the water collecting? Are there puddles in some places? Why might a garden help?

Visit the Melbourne Water website and watch the [short video on building a raingarden](#)⁴⁵ to explore WSUD techniques. Select one feature to research.

Year level/s: Year 7

Key curriculum link/s: Year 7 HASS (ACHASSK183; ACHASSK188; ACHASSK190); Year 7 Geography (ACHGK038; ACHGK043; ACHGK045); Year 7 Science (ACSSU116; ACSHE120; ACSHE121)

6.2 [Planning a new liveable settlement](#)⁴⁶

Lesson

Discuss the term 'liveability' and what students think increases the liveability of a place for them. The lesson involves planning a new settlement and what you would 'need' to ensure it was liveable. Water in the new settlement may be limited so students should consider all sources of water (dams, groundwater, desalinated sea water, recycled water, stormwater harvesting or other new innovative sources).

Variations

Play the online game '[Run that town](#)'⁴⁷ from the Australian Bureau of Statistics. Players make planning decisions based on 2011 Census data.

Year level/s: Year 7

Key curriculum link/s: Year 7 HASS (ACHASSK184; ACHASSK188; ACHASSK189; ACHASSK190); Year 7 Geography (ACHGK039; ACHGK043; ACHGK044; ACHGK045)

⁴⁴ Water – learn it. live it. (2013) *Volume 2 Water in the urban environment* p. 65

<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

⁴⁵ Melbourne Water, *How do I build a raingarden?*

<<http://www.melbournewater.com.au/getinvolved/protecttheenvironment/raingardens/Pages/How-do-I-build-a-raingarden.aspx>>

⁴⁶ WA Water Corporation (2013) *Planning a liveable settlement* lesson plan

<<http://www.watercorporation.com.au/home/education/teaching-resources/find-a-lesson-plan/lesson-plan/plan-a-new-liveable-settlement>>

⁴⁷ Australian Bureau of Statistics (2013) *Run that town* <<http://runthattown.abs.gov.au/>>

6.3 Stormwater campaign⁴⁸

Lesson

Many environmental campaigns from the past have encouraged people to put their rubbish in the bin or to clean up their local areas. In this activity in Volume 2 Water in the urban environment, students research past campaigns then create their own. Ideas for campaigns include creating slogans, posters, TV ads, songs or a performance.

Variations

Research some successful campaigns, for example Clean Up Australia Day and Keep Australia Beautiful. What makes them work?

Year level/s: Year 10

Key curriculum link/s: Year 10 History (ACDSEH127)

⁴⁸ Water – learn it. live it. (2013) *Volume 2 Water in the urban environment* p. 48
<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

7 Water uses

7.1 Drink tap double bubble⁴⁹

Hands-on activity

On one piece of paper, draw (or make on the computer) a cluster of blue bubbles attached to a bubble labelled 'tap water', a cluster of purple bubbles attached to a bubble labelled 'bottled water' and a cluster of green bubbles attached to both. Inside the blue bubbles, students list all of the things that are unique to treated tap water such as: goes through a filtering system, treated according to highly regulated standards. Inside the purple bubbles, they list all of the things that are unique to bottled water, such as: uses water from underground springs, uses plastic bottles. Inside the green bottles, students then list what bottled water and tap water have in common, such as: necessary for survival, helps keep us hydrated. Discuss the positives and negatives of both types of water.

Variations

This activity can be used in an incursion with another activity that explores why water is important for human health. It uses a three-dimensional anatomical model of a human with removable parts to build understanding of how water helps the human organs to function at their best. The incursion also provides information on the environmental and cost benefits of drinking tap water.

Year level/s: Years 4 and 7 but also suitable for Years 5-8

Key curriculum link/s: Year 4 HASS (ACHASSK090); Year 7 Science (ACSSU116; ACSHE120)

7.2 Bottled water⁵⁰

Hands-on activity

This activity from Volume 3 Water in the community, asks students to list the good and bad aspects of bottled and tap water before and after they watch the Youtube video *The Story of Bottled Water* (see the Resources list). A worksheet is provided to compare their impressions.

Variations

This activity has a number of extensions:

- Students create a chant, song or poem that reminds other students to bring a refillable water bottle to school instead of buying bottled water.
- Students plan a campaign to ban bottled water being sold or used at school.
- Students investigate the strategies used to market bottled water.

Year level/s: Years 4 and 7 but also suitable for Years 5-8

Key curriculum link/s: Year 4 HASS (ACHASSK090); Year 7 Science (ACSSU116; ACSHE120)

⁴⁹ North East Water, *Drink tap double bubble* activity teacher information worksheet, p. 2
<<http://newater.com.au/learning-centre/education-schools-early-childhood/teacher-resources.asp>>

⁵⁰ Water – learn it. live it. (2013) *Volume 3 Water in the community* p. 48
<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnItLiveItprogram/index.htm>>

7.3 Water bingo⁵¹

Game

To prepare for this game (in the Foundation unit), record a range of water sounds: running a shower, brushing teeth, drinking water/water in a glass, flushing toilet, water running down a sink, a running tap and a sprinkler. You could also include other water sounds: waves, rainfall, frogs and thunder. A number of websites provide free downloads of sound effects. An activity sheet is provided with images that match the sound effects or you could make your own.

Students then play water bingo—they place a coloured counter on the image when they hear the matching sound. The student who matches all correctly and shouts 'bingo' is the winner.

Variations

Afterwards, students can engage in activities that use water such as making jelly, painting with watercolours and blowing bubbles using water and detergent.

Year level/s: Years Foundation and 1

Key curriculum link/s: Foundation Science (ACSSU003); Year 1 Science (ACSSU019)

⁵¹ Gold Coast City Council Make your water mark! (2012) *Watersaver education program Primary school kit - Foundation to Year 7*. Foundation, p. 6 <<http://www.goldcoast.qld.gov.au/make-your-water-mark-watersaver-primary-school-program-12659.html>>

8 Using water wisely

8.1 School water audit⁵²

Lesson

This lesson or introductory activity is useful for students in the Early Years to highlight just how many places water comes from around the school. Students are asked to suggest the areas around the school where they think water is used. Make a list then discuss any areas that they may have overlooked. Students may think of drinking fountains and taps but may not take showerheads, toilets or tanks into consideration. Students take a walk around the school and grounds to review all of the places water is used. Complete a water audit to see what fixtures and fittings the school has and make a note of any that are broken or leaking. Worksheets are provided or can be created to suit a school's size and facilities.

Variation

The Water – learn it. live it.⁵³ version in Volume 3 Water in the community, provides worksheets to fill in the information students find during their audit. The activity can be extended using copies of the school's water bills and datalogger information to graph and chart water use.

Year level/s: Years 2 and 7 but also suitable for Years 3-6

Key curriculum link/s: Year 2 Science (ACSSU032; ACSHE035); Year 7 Science(ACSSU116; ACSHE121)

8.2 Using water efficiently⁵⁴

Take-home activity

A single dripping tap can waste up to 20,000 litres of water per year. If found early, leaking taps may be fixed by simply replacing a worn washer. Water efficient appliances are another effective way to use only the water you need at home. This worksheet in Volume 3 Water in the community, allows students to audit their home to find out how many leaks they have and how many water efficient appliances are in each room of the house. Another worksheet offers a place for students to calculate how much water is used for each dripping tap.

Variations

The Water Efficiency Labelling and Standards (WELS) program is introduced to draw students' attention to water efficient products.

Year level/s: Year 7 but also suitable for Years 3-6

Key curriculum link/s: Year 7 Science (ACSSU116; ACSHE121)

8.3 Home water audit⁵⁵

Hands-on activity

⁵² Queensland Government: Water: Learn it for life! (2013) *Preparatory to year 3 Lower Primary School Water Audit*, p. 6
<<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/76edf16d-07cd-486e-8533-260865809157>>

⁵³ Water – learn it. live it. (2013) *Volume 3 Water in the community* p. 29
<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

⁵⁴ Water – learn it. live it. (2013) *Volume 3 Water in the community* p. 32
<<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

⁵⁵ Queensland Government: Water: Learn it for life! (2014) *Year 4 Science: Are we living sustainably?* p. 13
<<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/70f4728e-a187-49a1-adfe-631e25a94ce8>>

To build on the school water audit, students can predict then record their water use at home. Read the beginning of the online book '[Whizzy's Incredible Journeys](#)'⁵⁶ and continue on with the 'family journey' when asked to choose a path. This will introduce students to the concept of conserving water at home. Students predict how much water they use in different areas of their home. They can also calculate the amount of water they use each day with some simple calculations as amounts are provided on the worksheet.

Variations

After students complete their audit, the class can discuss their results and graph them in different ways.

Year level/s: Years 3, 4, 5, 6

Key curriculum link/s: Year 3 and 4 Science (ACSHE051/ACSHE062); Year 5 and 6 Science (ACSHE083/ACSHE100)

8.4 [Embodied water](#)⁵⁷

Hands-on activity

Embodied water, sometimes called 'virtual' or 'hidden' water, refers to the total amount of water required to produce an item, for example an apple, a loaf of bread, a car or a smartphone. Embodied water takes into account the water used in the item's production and transport. Using an online calculator or app, students research how much water is used to produce everyday items. Using pictures or models of items (for example, a chip packet or a fake apple or toy cow), ask students to put in order the items that use the least water to the items that use the most. This activity is found in Volume 3 Water in the community.

Variations

The [Angela Morelli infographic](#)⁵⁸ can be used as an introduction to this topic.

Year level/s: Year 7 but also suitable for Years 5, 6, and 8

Key curriculum link/s: Year 7 Science (ACSSU116; ACSHE121); Year 7 HASS (ACHASSK184); Year 7 Geography (ACHGK039)

8.5 [Using greywater](#)⁵⁹

Demonstration or hands-on activity

Greywater contains contaminants like detergent, oil and soap so it cannot be re-used for drinking. However, these contaminants are often hard to see so care must be taken when and where we use greywater. This experiment in Volume 3 Water in the community demonstrates the typical contaminants in our greywater and students are asked to analyse and research the effect it might have on our gardens.

Into a large empty soft drink bottle, pour 3 cups of water. Add 1 cup of cooking oil. Screw the lid on and shake it. What do you see? Take the lid off and add 1 cup of dishwashing detergent. Replace the lid and shake it again. Students record

⁵⁶ Queensland Government (2014) *Whizzy's incredible journeys* <<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/57fca082-d850-4a14-be89-1615f9947d12>>

⁵⁷ Water – learn it. live it. (2013) *Volume 3 Water in the community* p. 42 <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

⁵⁸ Morelli, Angela (2012) *What if I told you...* <<http://www.angelamorelli.com/water/>>

⁵⁹ Water – learn it. live it. (2013) *Volume 3 Water in the community* p. 64 <<http://www.yvw.com.au/Home/Inyourcommunity/Education/WaterLearnitLiveitprogram/index.htm>>

their observations again. Leave the bottle to settle for 10 minutes and describe what you see. Does it look safe enough to drink or to put on your garden?

Variations

With students, discuss where greywater may be used around the home and where it should not be used.

Year level/s: Year 7

Key curriculum link/s: Year 7 Science (ACSSU116; ACSHE121); Year 7 HASS (ACHASSK184; ACHASSK183); Year 7 Geography (ACHGK039; ACHGK038)

9 Water career and water management promotion

Water careers and water management in general can be promoted through a wide range of school and community events and activities including National Water Week events and poster competitions, Kids Teaching Kids conferences and Natural Resource Management field days. The following examples are popular options.

9.1 Careers expo

Event

Local governments often run careers expos for year 10 and/or 11 students. Setting up a stand at one of these expos, along with a member of staff who is an engineer or human resource professional, is a great way to show students what your company offers and what types of careers are available in the water industry.

Variations

Some expos give students a passport this is stamped once certain activities are completed. Students fill in the passport throughout the day. Puzzles or games are popular for this. Giveaways are also handy.

Year level/s: Years 9 and 10

9.2 Water themed field day

Event/Excursion

Invite students along to a water or environmental themed field day, along with other environmental education providers. Students complete hands-on activities throughout the day and learn more about the industry.

Year level/s: Years 5-8

9.3 Guest speaker

Incursion

Some teachers like having an industry professional come to speak to their students in specific classes. This may also be relevant for TAFE or university groups. Industry professionals talk about their career and other careers in the water industry and conduct a question and answer session. If the water corporation has a graduate program, this may be useful for senior secondary, TAFE and/or university groups. Younger students may be interested in how their learning relates to the water industry.

Year level/s: Years 5-9, TAFE and university students in a range of courses (Engineering, Science, Administration, Education, Communication)

10 Resources

10.1 Books

CSIRO

The Waterbug Book by John Gooderham

<http://www.publish.csiro.au/pid/3148.htm>

NT Power and Water

ABC Water Booklet

http://www.powerwater.com.au/_data/assets/pdf_file/0003/56415/ABC_water_booklet_-_final_copy_for_web.pdf

QLD Department of Energy and Water Supply

Whizzy's children's books

Whizzy's incredible journeys

<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/57fca082-d850-4a14-be89-1615f9947d12>

Whizzy's new adventures: journey through the pipes

<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/499dc9f8-6824-4b26-8096-02797b9b21d6>

Guidelines for use

<https://publications.qld.gov.au/dataset/waterwise-education-resources/resource/cbd13760-5329-4e24-a637-3db03c7a0fff>

SA Water

Captain Plop's water-saving mission

Captain Plop: the desalination adventure

Captain Plop and the tour de recycle

<https://www.sawater.com.au/community-and-environment/schools/education-resources>

The Gould League

Australian guide to pond life

<http://gould.org.au/product/australian-guide-to-pondlife/>

Yarra Valley Water

Big book about water

<http://www.yvw.com.au/yvw/groups/public/documents/document/bigbookaboutwaterpdf.pdf>

10.2 Posters

NT Power and Water

Inland water cycle

<http://helpsavetheplanet.com.au/factsheets/>

QLD Department of Energy and Water Supply

A large number of posters that complement the curriculum resource, including: the water cycle, total water cycle management and the inland water cycle.

<http://www.qld.gov.au/environment/water/use/education/>

SA Water

Treating water, treating and recycling wastewater

<https://www.sawater.com.au/community-and-environment/schools/online-learning>

WA Water Corporation

The WA Water Corporation has posters based on different topics.

Education posters – Includes the water cycle, the wastewater path and drink water for a healthy life posters.

Fresh Water Thinking posters

Posters about preserving our precious water.

Stop the Drop posters

Posters developed with the Fitzroy Crossing and Roebourne communities to educate their local community on general water saving practices. The cartoon family 'the Johnsons'; include JJ, Grandma and older sister Nerida. The posters aim to communicate with Indigenous communities focusing on seven key messages which give practical advice on how to save water in and around the home.

Walter the Water Drop posters

A set of 10 colourful A3 illustrative posters. Each poster expands on a simple key message relating to water and health, protecting drainage systems and the natural environment, saving water and protecting wastewater systems.

Water supply maps

A set of nine posters that map the water supply systems throughout Western Australia.

<http://www.watercorporation.com.au/home/education/teaching-resources/posters-and-maps>

10.3 Apps

SA Water

Sewage sleuths

Let the poo thru

Operation Aqua

Project Desal

Captain Plop's water saving mission

<http://www.sawater.com.au/community-and-environment/schools/online-learning>Yarra Valley Water

Choose Tap

<http://www.yvw.com.au/Home/Inyourcommunity/ChooseTap/SmartphoneApp/index.htm>

Others

The Waterbug App

<http://www.thewaterbug.net/>

Water your body (iTunes or Google Play-Android)

10.4 Games, activities and animations

Angela Morelli

Virtual water infographic

<http://www.angelamorelli.com/water/>

ABC Science

<http://www.abc.net.au/science/catchmentdetox/files/home.htm>

EPA (USA)

<http://water.epa.gov/learn/kids/drinkingwater/gamesandactivities.cfm>

Interactive site for education

<http://interactivesites.weebly.com/clouds--water-cycle.html>

NT Power and Water

Save buckets

<http://helpsavetheplanet.com.au/cool-stuff/save-buckets-game/>

Project WET – Water Education for Teachers

<http://www.discoverwater.org/>

SA Water

Sewage Sleuths

<http://www.sewagesleuths.sa.edu.au/>

Sewage Sleuths user guide

<http://www.outreacheducation.sa.edu.au/wp-content/uploads/2015/02/Sewage-Sleuths-TR-Final.pdf>

South East Water

Natural water cycle and game

<http://www.educationsoutheastwater.com.au/natural-water-cycle/>

Urban water cycle and game

<http://www.educationsoutheastwater.com.au/melbourne-water-cycle/>

Sydney Water

Primary school

<http://www.sydneywater.com.au/SW/education/Programsresources/Primaryschool/index.htm>

WA Water Corporation

Interactive activities

<http://www.watercorporation.com.au/home/education/teaching-resources/elearning>

Wannon Water

Activities and games

http://www.wannonwater.com.au/index.php?option=com_content&task=view&id=544&Itemid=519

Wetrocks

<http://www.wetrocks.com.au/games>

10.5 Music

WA Water Corporation

<http://www.watercorporation.com.au/home/education/teaching-resources/music>

10.6 Videos

Barwon Water

Education video

<http://www.barwonwater.vic.gov.au/learning/schools/resources/video-the-barwon-water-cycle>

Ecosafe international

Innovative technologies to improve water quality

https://www.ted.com/talks/michael_pritchard_invents_a_water_filter

Hands on H2O Water Lab

www.watersciencelab.com.au

<http://www.watersciencelab.com.au/videos.html>

H2oz Water careers

<http://www.h2oz.org.au/videos.aspx>

Melbourne Water

Wetland videos

<http://www.melbournewater.com.au/getinvolved/education/educationalresources/Pages/Multimedia-resources.aspx>

WA Water Corporation

<http://www.watercorporation.com.au/home/education/teaching-resources/videos>

<https://www.youtube.com/user/Watercorpwa>

The story of stuff project

The story of bottled water

<http://storyofstuff.org/movies/story-of-bottled-water/>

SA Water

Treated well, it's not just waste: A remarkable journey. (Part 1 of 3)

<https://www.youtube.com/watch?v=iocus1ZyNbU>

Treated well, it's not just waste: An amazing transformation. (Part 2 of 3)

<https://www.youtube.com/watch?v=4cbnRwWGIE0>

Treated well, it's not just waste: An important responsibility. (Part 3 of 3)

https://www.youtube.com/watch?v=yK4Q_RQRIT8

SA Water – safe, clean drinking water

<https://www.youtube.com/watch?v=1iRJ0AVoblw>

South East Water

States of matter

<http://www.educationsoutheastwater.com.au/resources/changing-water-video/>

How we use water

<http://www.educationsoutheastwater.com.au/resources/water-for-our-future-video/>

Sewage treatment

<http://www.educationsoutheastwater.com.au/resources/were-does-the-water-go/>

Sydney Water TV

Water filtration explained

<https://youtu.be/31ZUXx6NXDA>

Ultrafiltration at St Marys Water Recycling Plant

<https://youtu.be/Ge6RT6eAXDA>

How does reverse osmosis work?

https://youtu.be/aVdWqbpbv_Y

The osmosis principle

<https://youtu.be/2RNVkHRQ-Lg>

Unity Water

Educational videos including the sewage treatment process

<http://unitywater.com/video>

Virtual tours, excursions and incursions

ACTEW Water

A variety of videos

<https://www.youtube.com/user/ACTEWCORPORATION>

SEQ Water

Virtual tour

<http://www.seqwater.com.au/education/virtual-tour>

South East Water

Melbourne water treatment plant tours and SEW Mt Martha treatment plant tours

<http://www.educationsoutheastwater.com.au/excursions/>

School incursions

<http://www.educationsoutheastwater.com.au/incursions/>

Sydney Water

Water recycling treatment

<http://www.sydneywater.com.au/Education/Tours/virtualtour/tour.html>

Desalination

<http://www.sydneywater.com.au/Education/Tours/DesalVirtualTour/index.html>

WA Water Corporation

A great variety of videos including groundwater, catchment to tap, desalination, reverse osmosis and water and the drying climate.

Youtube playlist: <https://www.youtube.com/user/Watercorpwa>

Fact sheets

Barwon Water

Excursion fact sheets

<http://www.barwonwater.vic.gov.au/learning/schools/excursions-and-incursions/black-rock-wrp>

<http://www.barwonwater.vic.gov.au/learning/schools/excursions-and-incursions/west-barwon-reservoir>

<http://www.barwonwater.vic.gov.au/learning/schools/excursions-and-incursions/wurdee-boluc-wtp>

Melbourne Water

Teacher resources and fact sheets

<http://www.melbournewater.com.au/getinvolved/education/educationalresources/Pages/Educational-resources.aspx#ESW>

NT Power and Water

<http://helpsavetheplanet.com.au/factsheets/>

SEQ Water

Fact sheets and teaching resources

<http://www.upadrygully.com.au/content/teaching-resources>

South East Water

Fact sheets about treatment plants, recycled water and the water cycle

<http://www.educationsoutheastwater.com.au/resources/>

Wannon Water

A variety of fact sheets including the water cycle and treatment plant information

http://www.wannonwater.com.au/index.php?option=com_content&task=view&id=105&Itemid=521

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