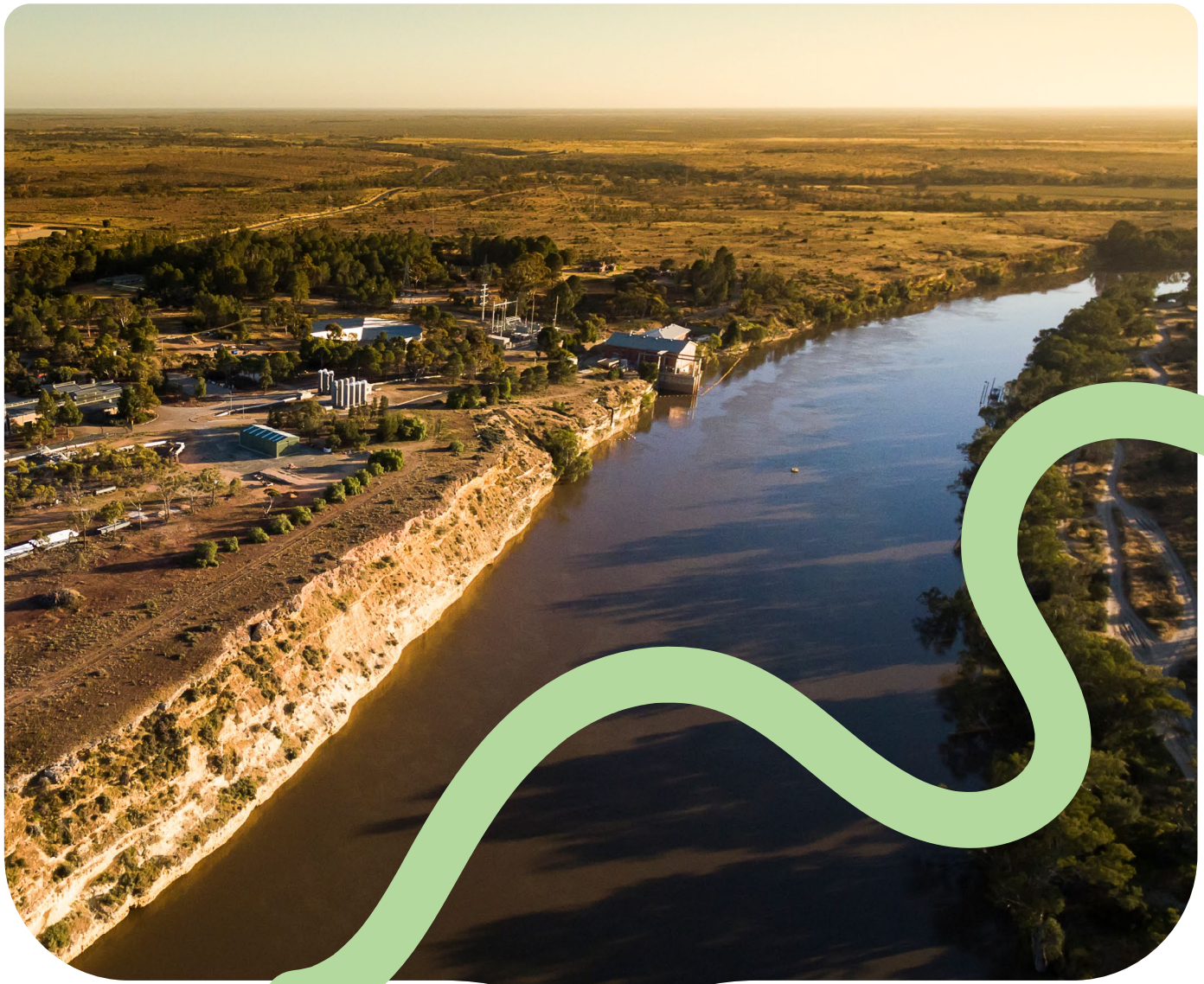
The Well

Tap into water education

Resource Force

Teacher's guide



Arnie Watertrigger needs your help! In the year 2122, Evil Scientist Fert Eliza Runoffalot has found a way to stop the water cycle, leading to too much stinky stagnant water and not enough of the fresh stuff. Arnie communicates from the future to ask your help to solve a series of puzzles, to defeat Fert Eliza's sinister plan.

SA Water

Government of South Australia

Location: SA Water House, Victoria Square / Tarntanyangga, Adelaide

Contact: thewell@sawater.com.au

Learning outcomes

Throughout the workshop students will develop an understanding of:

- Aboriginal and Torres Strait Islander custodianship of, and connection to land and waters.
- the water cycle and its importance in sustaining all living things
- water security and the challenges supplying water for a growing population in a changing climate
- efficient water use, and how we can recycle water and its by-products
- the value of water and our water services
- how our actions now will impact the future of our planet.

Planning your workshop

- Book your workshop via our website.
- Arrange transport to and from SA Water House.
- Advise our education team about any accessibility requirements.
- If you need to cancel, please get in touch as early as possible, so another group may have the opportunity to book.

Please note, we don't recommend booking two workshops for the same class in one day. The workshop structures are similar so they would feel repetitive.

Instead, consider pairing your program at SA Water with another experience in Adelaide focused on sustainability, environment, or resource management. For instance, you can:

- Check out the Adelaide Central Market's sustainability-themed teaching resources.
- Learn about biomes and food security at Adelaide Zoo in one of their educational programs.
- Explore wetlands and sustainability with a program at the Botanic Garden.

Access and safety

- Buses can drop off and pick up students on the western side of SA Water House in the bus lane off Victoria Square.
- Arrive at the courtyard north of SA Water House ten minutes before the start of your booking. There is shade, lawn and a water fountain in the courtyard.
- Your workshop facilitator will meet you in the courtyard and accompany you inside.
- Please let students know the building has a central atrium and sound carries across all floors, particularly when walking to and from the Learning Centre.
- Toilets are available on the ground floor. We encourage only small groups enter these at a time.
- There is an elevator available to access the Learning Centre if needed.
- Ensure everyone holds the handrail as you go up and down stairs, and take note of safety instructions from your facilitator.
- School bags can be stored at the back of the room or outside the Learning Centre along the wall during the workshop.

Risk Assessment

Sports, adventure, camps and excursions risk assessment for additional hazards		
Hazard identification (What is the issue of concern?)	**Risk Controls (What are you doing to eliminate or reduce the risk?)**	**Risk (With all controls in place)**
Trip and fall hazards	• Use handles to get on and off bus or transport. • Stay on paths or grassy areas, away from traffic. • Hold the handrail when walking up or down the stair. • Walk, don't run. • Elevator is available for those with accessibility need.	
Outdoor hazards	• Cross roads with teachers or adults positioned around the group • Advise students to wear sunscreen, bring a hat and water bottle, and dress appropriately for the weather. • Shade and water fountain provided in courtyard. • Students may wait quietly inside in adverse weather. • Teachers to bring any insect allergy requirements.	
Typical classroom hazards	• Listen to safety brief at the start of the workshop. • Walk, don't run. • Don't sit or lean on tables. Chairs are cleared to facilitate movement during the workshop, but can be provided if needed. • Students should be mindful of the people and objects around them (especially during the busy workshop activities).	

		Consequences				
	WHS Risk Assessment Matrix	First aid Personal support or counselling	Medical or dental treatment	Hospital emergency department (out-patient)	Admitted to hospital (in-patient)	Death, permanent disabling injury
	Certain: to occur at some stage	Medium	High	High	Extreme	Extreme
	Likely: to occur	Low	High	High	Extreme	Extreme
	Possible: could: reasonably occur	Low	Medium	Medium	High	Extreme
	Unlikely: to occur	Low	Low	Medium	High	Extreme
	Rare: Not expected to occur	Low	Low	Medium	Medium	Extreme

Before your visit: introduction to SA Water

Check your students' knowledge about the water services provided by SA Water. Use a think, pair, share approach, or sticky notes on the board, to get your students thinking about the following:

1. Where did your water come from, before it reached your tap?
2. How does water become clean and safe to drink?
3. What happens to dirty water when it goes down the drain or is flushed away?

Watch this short video to see an overview of the water services provided by SA Water.

Here are some extra SA Water facts:

- We look after 31 reservoirs and weirs as part of our water source network.
- We use over 250 bores to access ground water in the driest parts of our state.
- We have 13 desalination plants, including 3 seawater and 10 groundwater plants.
- We treat freshwater in 41 conventional water treatment plants.
- Treated water is delivered through over 27,500km of water mains – the longest water network in Australia.
- We move water around with 286 water pump stations and store it in 610 water storage tanks.
- We have over 9,000km of sewerage mains (pipes carrying wastewater/sewage), connected to 42 wastewater treatment plants.
- Across the state there are about 2,000 people that work for SA Water, or about 6,000 including contractors.

You can learn more about our 160+ year history here, and explore historic photos of many sites here.

After your visit

After your Resource Force workshop, use the following activities to dive further into the facts and science behind sustainable water management with your students.

We value your feedback and invite you to complete our online survey.

Check out The Well to explore our learning resources, professional development opportunities, and other student experiences.

Review

Print the Resource Force review worksheet below and have students review their workshops experience on their own or in pairs. A think, pair, share approach may help refresh memories. Alternatively, use the quiz questions below as prompts to review together as a class.

The answers to the fill in the blanks section are:

1. The four main water sources for South Australia are the **Murray River**, **reservoirs**, **groundwater**, and **seawater**.
2. Purified **recycled** water is one example of a sustainable water source.
3. We have to do a lot, with the **water we've got**.

Use the Resource Force quiz below to review the water cycle and water security topics in more detail.

Questions	Answers
1. Name one of the stages of the water cycle.	Evaporation, transpiration, condensation, precipitation.
2. True of false: we are drinking the same water molecules dinosaurs drank millions of years ago?	True.
3. Is water a renewable resource?	Yes, water is constantly moving through the water cycle and taking different forms.
4. What is water security?	Water security is having enough drinking water for the future.
5. Why is water security an issue if water is a renewable resource?	We rely on treated water to drink and use safely, and conventional water treatment usually requires fresh water, which is in much smaller supply than ocean water.
6. How does climate change impact water security?	Droughts or other natural disasters like bushfires or flooding may impact the availability of fresh water.
7. What happens to the dirty water that goes down our drains and toilets?	Wastewater travels through pipelines to a wastewater treatment plant, where it is treated and cleaned. The water cycle is nature's way of cleaning water.
8. Explain what SA Water calls the water lifecycle?	The system of recycling water, i.e. treating wastewater to remove any nasties, then recycling water for use in agriculture and irrigation.
9. What animals at the Adelaide Zoo eat food grown with recycled water?	The pandas at Adelaide Zoo eat bamboo grown with recycled water. It is also used to water gum trees that grow food for koalas.
10. How is new water made?	Trick question! We can't make new water. That's why we do a lot with the water we've got.

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Resource Force review

What problem did Arnie Watertrigger need our help to solve?

What experiments did you do?

What did you learn about SA Water?

What technical words do you remember?

What else do you remember about the experience?

Fill the blanks

1. The four main water sources for South Australia are _____ , _____ , _____ , and _____ .
2. Purified _____ water is one example of a sustainable water source.
3. We have a lot to do with the _____ _____ _____ .

Dive Deeper

Extend student learning after your Resource Force workshop with a water security deep dive.

Below you'll find key questions for students to discuss, and resources that will help students learn the answers. Resources vary and may be appropriate for primary or secondary students.

Key questions	Resources
What is water security?	• UN Water definition and infographic. • The Department for Environment and Water page on water security and their water security statement. • Global water crisis lesson plan.
When was the millennium drought and what were the local impacts?	• Frequently asked questions about the millennium drought in South Australia. • Historical drought data from the Bureau of Meteorology. • Students could interview a family member about what they remember from this period (including water restrictions).
Why does our water need to be treated (filtered and disinfected)?	• View our Water Quality video series to learn how we use a multiple barrier approach to protect water quality and ensure we have access to safe, clean water. • Water access and sanitation for all is one of the UN Sustainable Development Goals.
What are our water sources in South Australia?	• We have 16 reservoirs to store fresh rainwater. View up to date reservoir data here. • The Murray River supplies over 50% of the state's drinking water. View the river's daily flow rates, maps and data here. • Watch the Managing our Murray video series and discover how we manage the flow of the river, support its biodiversity, and how the river and community are impacted by flood events. • Some of Adelaide's water comes from the ocean. Read about the Adelaide Desalination Plant and the monthly production rates here. • The driest parts of our state rely on groundwater. Sometimes, this water is treated using desalination technology too.
Where does our water come from at home and school?	• Look up your drinking water profile to see your local water sources and what's in your water. Compare your water to other locations in South Australia.
How can I learn more about Aboriginal and Torres Strait Islander perspectives on water management?	• Aboriginal and Torres Strait Islander people have nurtured a deep understanding of water systems and places for many thousands of years. The five episodes of our Water Wisdom video series share knowledge through the voices of Adnyamathanha, Ngarrindjeri, Boandik, Kaurna, and Barngarla people. • Download the Water Wisdom workbook to complete alongside the video series.
What is being done to ensure water security for the future?	• SA Water's Resilient Water Futures long-term plan.