The Well

Tap into water education

Amazing Waste

Teacher's guide

Dr. Sue Ridge is on a delusional mission to prove herself and her new deadly device. She's trapped water genius, Ima Scientist, in the wastewater treatment plant! We've assembled the best wastewater scientists in the country to save Ima and the wastewater plant – YOU! You'll need to work together to help Ima Scientist escape through the facility and stop Sue Ridge in her tracks.

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:

- the purpose and importance of wastewater treatment
- the stages of the wastewater treatment process
- the 3P's – how to keep the wastewater network healthy
- waste management
- recycling water and reusing waste products

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 Amazing Waste 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 Amazing Waste 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 other word for sewage is **wastewater**.
2. Wet wipes cause a lot of problems in our pipeline network and wastewater treatment plants because they can cause **blockages**.
3. One of the methods of disinfection uses **UV light** to kill any nasty bacteria and make water safe to return to the environment. (**Chlorine** is also an acceptable answer).

Use the Amazing Waste quiz below to review the water cycle and water security topics in more detail.

Questions	Answers
1. What is wastewater?	Dirty water, including from the shower or washing machine. Sewerage (from the toilet) is a kind of wastewater.
2. What is the first stage in the wastewater treatment process?	Screening. In this stage, all the big items are removed.
3. What item is commonly flushed when it shouldn't be?	Wet wipes. These items are woven with plastic so do not break down in wastewater like toilet paper. They are a menace for sewer pipes and wastewater treatment plants.
4. What is added to the wastewater to feed on the particles and impurities?	Microorganisms – microscopic living organisms. Bacteria are microorganisms.
5. Sludge is removed from wastewater and can be recycled for use as fertilizer. What is it called?	Biosolids.
6. What is ultraviolet light used for in wastewater treatment?	Strong UV light can disinfect water by inactivating microorganisms like bacteria.
7. True or false: there are more microorganisms in the human body than there are stars in the milky way.	True.
8. Name one way recycled water is used in SA.	Watering farmland and public parks, filling water features, and helping to grow the bamboo that feeds Adelaide Zoo's pandas.
9. What household bin should food scraps go into?	The green bin, for green organics to be composted.
10. There are only 3 things that should be flushed down the toilet. What are they?	The 3 Ps: pee, poo and (toilet) paper.

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Amazing Waste review

What problem did Ima Scientist 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 other word for sewerage is _____ .
2. Wet wipes cause a lot of problems in our pipeline network and wastewater treatment plants because they can cause _____ .
3. One of the methods of disinfection uses _____ to kill any nasty bacteria and make water safe to return to the environment.

Dive Deeper

Extend student learning after your Amazing Waste workshop with a wastewater treatment 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
Why does our wastewater need to be treated?	• Water access and sanitation for all is one of the UN Sustainable Development Goals.
What are the steps of the wastewater treatment process?	• Wastewater treatment fact sheet. • Read more about how we manage wastewater here.
How can wastewater be recycled and re-used?	• We recycle about 30% of our treated wastewater. Read more about our recycled water networks here. • Water recycling technology is used around the world, and even in space. See how water is recovered and recycled for astronauts on the International Space Station.
How was wastewater managed in the past?	• The stinky history of sewerage lesson plan.
How can we take care of our wastewater network?	• Healthy sewers videos. • Poo Patrol with the Marine Discovery Centre and SA Water video.
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.