

Module 5: Clean safe water

Time: 120 min

Aim

To develop students' understanding of access to clean, safe water. The suggested learning sequence will:

- explore how water gets cleaned before coming to our homes
- engage with the concept of water inequality – how not all people have equal access to clean, safe water
- identify similarities and differences between how people in other countries and Australia access, perceive and use clean water

Students will build their understanding of the processes to provide consistent, high-quality drinking water and recognise how easy it is for us to access. By appreciating water, we can build long-term positive attitudes to use and re-use water wisely.

Key inquiry questions

- How did water get to you today? Was it clean? How was it cleaned?
- Does everyone have clean safe water?
- How can we educate people about tap water?

Background information

Have you thought about your water today? How did it get to you? Did someone clean it? What did it look like and taste like? We all need safe, clean water to be healthy and well.

In Australia, and in many countries too, freshwater can be scarce. Many cities rely on a mix of water sources which are less dependent on rainfall including oceans, recycled water and groundwater.

People use technology, speeding up nature's cleaning process, to treat and filter water. We use water filtration and desalination to produce safe drinking water. These technologies use a physical process (like filtering) and a chemical process (like balancing pH). We

add small amounts of chlorine to protect the water from pathogens. Clean water is stored in reservoirs, then delivered in pipes to people's homes, schools and businesses. All along the way, our water is checked and tested by scientists to ensure it meets the Australian Drinking Water Guidelines, which are some of the strictest in the world.

Not everyone is so fortunate. People all around the world, find it hard to access clean, safe water. Many still use buckets to collect and carry water to their homes. Would life be different if we had to get our water this way?

Many people coming to live in Australia for the first time are surprised that they can drink our high-quality water straight from the tap.

Syllabus outcomes

English

EN1-10C – Thinks imaginatively and creatively about familiar topics, ideas and texts when responding to and composing texts.

EN1-11D – Responds to and composes a range of texts about familiar aspects of the world and their own experiences.

Geography

GE1-2 – Identifies ways in which people interact with and care for places.

Science

ST1-1WS-S – Observes, questions and collects data to communicate and compare ideas.

ST1-4LW-S – Describes observable features of living things and their environments.

Creative arts

VAS 1.1 – Makes artworks in a particular way about experiences of real and imaginary things.

VAS1.2 – Uses the forms to make artworks according to varying requirements.

Syllabus skills

English

- Develop knowledge, understanding and skills to communicate through speaking, listening, reading, writing, viewing and representing.
- Express themselves and their relationships with others and their world.

Geography

- Develop skills to acquire, process and communicate geographical information.

Science

- Develop and apply skills in scientific inquiry through the process of working scientifically.

Visual arts

- Apply skills and understanding in making artworks informed by their investigations of the world as a subject matter and use of expressive forms.

Teaching and learning

Lesson 1: Your drinking water (50 min)

Inquiry question: How did water get to you today? Was it clean? How was it cleaned?

Explore how we treat and deliver drinking water in big cities. Use a hands-on activity to see how filtration works.

Vocabulary

Access, clean, safe, filter, filtration, plant, reservoir, disinfect, solid particles predict, observe.

Discussion notes

The way we treat drinking water depends on lots of factors, like where the water came from and what quality it was to start with. There are lots of examples of how big cities treat drinking here. You might like to explore how water is treated where you live. Your local water utility or council is a great place to start.

Activity 1: Wondering about water (10 min)

Preparation: worksheets and PowerPoint.

Using a wonder wall and the Clean safe water PowerPoint, get students thinking, questioning and sharing to understand their level of knowledge and interests. Ask students, have you ever wondered:

- have you thought about your drinking water today?

Resources

Wondering about water – Module 5 Clean safe water

- Clean safe water lesson plans
- Clean safe water PowerPoint
- Clean safe water worksheets
 - See, think, wonder
 - Plan an investigation
- How we filter our drinking water video youtu.be/Ke4y7k9nHXM
- Make a simple water filter video youtu.be/H1ae2dIVslw
- Make a pH indicator experiment video youtu.be/rgJgZ1Z-0xg

Materials

Scissors, poster paper, blank cards, sticky tack or tape, markers.

To make a simple water filter (per group) you'll need 4 plastic bottles with lids, 'muddy' water sample, 1 cup measure, 4 jars or the bottoms of the cut bottles, scissors, an 4 filtering materials (sand, coffee filter, cotton wool, sponge, wood chips, gravel, paper towels).

- how did it get to you?
- where did you get it from?
- did someone clean it?
- does everyone have clean water?

Either the teacher or students record statements and questions on cards and place on the wonder wall. Throughout the lessons, encourage students to reflect, ask questions and look for questions that have been answered. Use a word wall to capture any new vocabulary.

Activity 2: How did clean water get to you? (10 min)

Using the PowerPoint and background information introduce the concept of “access” to clean water, how water gets to our homes and capture the vocabulary on the word wall.

Watch the How we filter our drinking water video (youtu.be/Ke4y7k9nHXM) to see an example of how water is filtered in Sydney and refer to the background information to explore how water is cleaned. Investigate how water is cleaned where you live. Ask students, with a partner, to answer:

- Can you name a step used to clean water?
- Do you think all water is cleaned the same way?

Activity 3: Practical investigation – what makes a good water filter? (30 min)

Preparation: Watch the Make a simple water filter experiment video (youtu.be/H1ae2dIVslw) to see how it’s done and prepare your materials for class groups.

Ask students to consider:

- What happened? Why use 4 bottles with different filter materials?
- How can you compare and decide which filter works best?
- Which material do you think will make the best filter?

Display the Plan an investigation template in the PowerPoint to help students think and work like a scientist.

Record students' predictions, materials, risks and safe choices to conduct the investigation.

Perform the experiment. **Safety first: the filtered water in your experiment is not safe to drink. It's not clean enough.**

Optional: use the See, think, wonder worksheet for students to record individual observations.

Compare the water samples. Ask students:

- Which samples were the cleanest? Which filters worked the best?
- Were their predictions correct?
- Is the water safe to drink? Does the water need more treatment?

Record students' observations, conclusions and further questions in the Plan an investigation template.

Additional questions:

- How big do you think filters have to be to clean water for thousands of people?
- What would happen if no one managed, cleaned, filtered and tested your water?

Optional – Make a pH indicator experiment

Checking pH is one of the many tests to ensure water quality. The Make a pH indicator experiment shows that substances can be acidic, neutral or basic. Drinking water is treated to be neutral. This experiment builds students' understanding that water may have invisible (dissolved) substances and that pH tests can help us identify this.

Lesson 2: Clean water around the world (40 min)

Inquiry question: Does everyone have clean safe water?

Explore the issue of water inequality, that not everyone has easy access to water and some are more impacted than others. Engage students to appreciate water and their way of life through storytelling and empathy for others.

Vocabulary

Access, equal, fair, equality, inequality, sanitation, problems, challenges, opportunities, solutions.

Activity 1: Does everyone have clean safe water? (15 min)

Using the PowerPoint and explore the problem of water inequality. Ask students:

- Have you heard of the word equality? What is equality? What do you think inequality is?
- Some people don't have clean water to drink, wash or flush a toilet. What challenges can you imagine they might have every day?
- Using the A world without clean water worksheet predict what would happen if there was no access to water or it was difficult to clean. Ask students to consider how would this change your life? How does it make you feel?

Activity 2: How do others get their water? (25 min)

Step into someone else's shoes! Read or watch the recording of The Water Princess (gippswater.com.au/residential/education/teaching-resources) as a class. Complete the Water Princess Venn diagram with a partner and discussion questions on the Gippsland Water website as a class.

Resources

- Clean safe water PowerPoint
- A world without clean water worksheet
- Water solutions worksheet

Other resources

- The Water Princess – Teaching resources – Gippsland Water gippswater.com.au/residential/education/teaching-resources
- Water.org - water.org/
- WaterAid - wateraid.org/au/

Optional – success stories of others

Using the Water.org or WaterAid (wateraid.org/au/) website, pick and read a success story about getting improved access to clean water.

Fill in the Water solutions worksheet in groups or pairs to describe what were the problems before the solutions and compare life after getting better access to water. Use their worksheet to help reflect on how the story made them feel.

Lesson 3: Raise awareness (50 mins)

Inquiry question: How can we educate people about tap water?

Explore how people's past experiences influence their thinking about drinking water. Students will apply skills and understanding by creating an educational advertisement informed by their finds in the drinking water stories.

Vocabulary

Migrate, migrant, languages, advertisement, educate, awareness, communicate, audience.

Discussion notes

We have a diverse and vibrant community with many people coming from across the globe. It can be quite an adjustment if you've migrated from a place with little or no clean water or sanitation.

Sometimes people boil or purchase bottled water to drink and clean with. That's a lot of time and money wasted.

The community can actively engage with people and raise awareness that tap water is high quality, clean and safe to drink, locally sourced, environmentally friendly and great value.

Activity 1: How do people learn tap water is safe? (20 min)

Resources

- Clean safe water PowerPoint
- Abby Lau from Malaysia video youtu.be/2c5auFNI1CU
- Azam Muhammed from Pakistan video youtu.be/8f6bCeUu1s
- Azam and Abby worksheet
- Storyboard template
- We all say water worksheet

Other resources

- Google Maps google.com/maps/d/

Using the PowerPoint watch the Drinking water stories of Abby or Azam who migrated to Sydney. See the PowerPoint appendix for the script.

Using the Azam and Abby worksheet record what happened in their stories.

Ask students to share with a partner:

- How did they learn Sydney's drinking water was safe to drink?
- How can we teach people that drinking water is safe?

Activity 2: Can you create an advertisement (30 min)

Many people moving from other countries to Australia don't know that the tap water is safe. Ask students to create an advertisement to tell people our drinking water is safe. Consider what is important to the audience. What would convince people it's safe to drink?

Watch our Drinking water video in English and one translated video for inspiration. Ask students:

- Why is the video translated in multiple languages?
- How would this help to educate people from other countries?
- What type of advertising would you like to make? A poster, a video, a social media post?

Optional: use the video storyboard template to help students scaffold their advertisement ideas.

Optional: Do we all say 'water'?

Water is so important; we all have a word for water. Using the We all say water worksheet, learn some new words for water and guess where the words come from by pinning it to a printed world map or on Google "My Maps".

Extension activity – questionnaire and share

Research or interview a person that grew up in a different country. Share with the class their water story.

- What was their water story? Where did they grow up?
- How did they get clean water?

- How do they feel about their water now?

Summative task: What I learned about water (15 min)

- Direct students to write or draw their answer to one of the inquiry questions on a water droplet template.
- Droplets can be attached to a ribbon or string and hung from the ceiling, wall, or across the room.
- The water droplets can be used towards assessment.

Reflection (10 min)

Revisit the wonder wall and reflect on concepts covered in the lesson. Allow students time to share with each other and compare thoughts and questions. As a group, look for questions that have been answered and adjust on the wonder wall. Either the teacher or students record new statements and questions and place on the wall.

Teacher reflection/evaluation

Consider what worked, what didn't and changes for future delivery.

- Cultures of Thinking (Harvard): pz.harvard.edu/projects/cultures-of-thinking
- Bloom's Taxonomy: bloomstaxonomy.net/