Lesson Plan

Our city

Students will explore urban planning of the world's most liveable cities, including Perth. They will investigate how Water Corporation and Department of Water and Environmental Regulation (DWER) are working together to ensure Perth maintains its ranking.

Subject area:

Humanities and Social Sciences

Year level:

Year 7

Learning objectives:

- Understand the natural water cycle and apply this understanding to illustrate the Perth metropolitan urban water cycle.
- Identify factors influencing a 'liveable' and 'non-liveable' city and identify how Water Corporation and DWER are sustainably managing water in the design of a liveable city.
- Apply understanding of UN Sustainability Goals to identify how Water Corporation is ensuring water supply for the future.
- Describe a sustainable water treatment process.
- Identify other countries using sustainable water treatment processes.
- Create a 3D model of this process using recycled materials.

Curriculum links

Water in the world	ACHGK037
Water in the world	ACHGK039
Place and liveability	ACHGK043
Place and liveability	ACHGK044
Place and liveability	ACHGK045
Place and liveability	ACHGK047
Analysing	WAHASS71
Communicating and reflecting	WAHASS76

Cross curriculum priorities - Sustainability

OI.1	The biosphere is a dynamic system providing conditions that sustain life on Earth.
OI.3	Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.
OI.4	World views that recognise the dependence of living things on healthy ecosystems, and value diversity and social justice, are essential for achieving sustainability.
OI.7	Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.

General capabilities

Literacy

Critical and creative thinking

Personal and social capability

Information and communication technology (ICT) capability

Ethical understanding

Activity 1

Water sources

In this activity students will investigate the natural and the urban water cycle near their home or school. To consolidate their understanding, students will apply their knowledge to create a 3D tour of the urban water cycle near their home or school using images from Google maps.

Time required:

1 hour

Resources required:

- **iPad or computer per student**

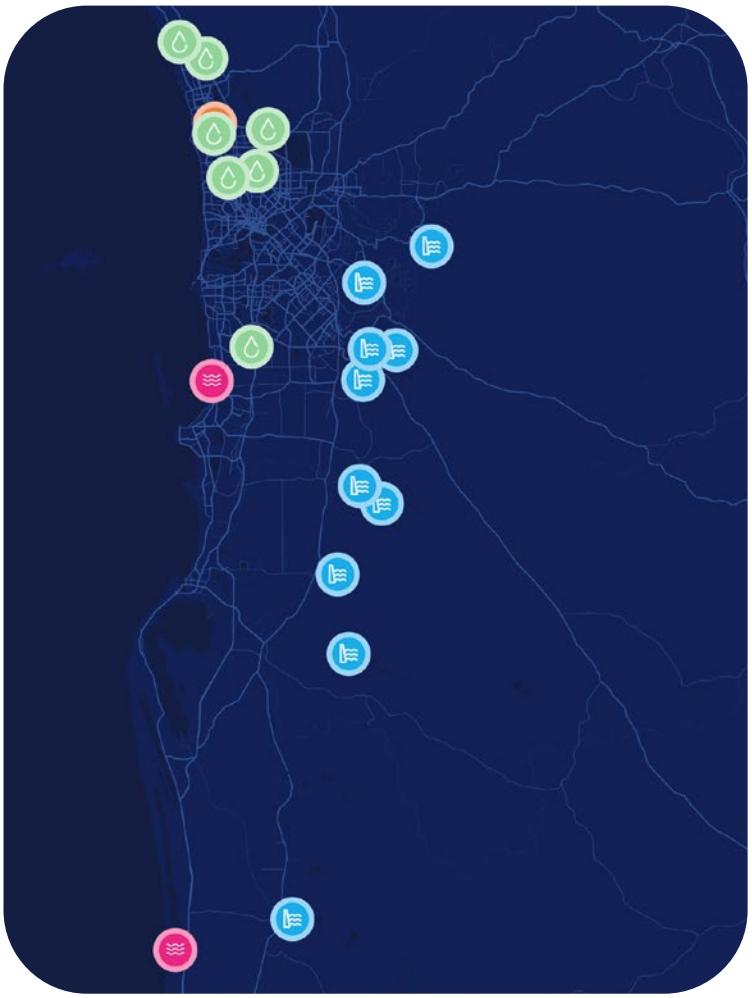
Preparation:

Ensure each student has access to:

1. Perth's water supply tool.
2. Google tour creator.

Steps:

1. Ensure students are familiar with the water cycle.
2. Connect to the Perth's water supply tool and get students to input their school or home address to investigate how water is supplied to their area.
3. Students must illustrate their understanding of the urban water cycle story and design a wall poster or an interactive web story to demonstrate.
4. Students may choose to integrate photos and uploads from Google maps to 3D Google tour creator as their interactive web story. This free platform allows students the opportunity to become creative in capturing photos and snips from Google maps to upload to their 3D tour.



Desalination
Groundwater
Dams
Groundwater replenishment

Liveable cities

Students will gain an appreciation for our beautiful state as they study the ten most liveable cities in the world compared with the least. Investigating how Water Corporation works closely with Department of Water and Environmental Regulation (DWER), students will understand the water management strategies applied to maintain Perth's high ranking.

Time required:

2 - 3 hours

Resources required:

- **iPad or computer per student**

Preparation:

Ensure access to:

1. Least liveable cities in the world
2. Ten most liveable cities in the world
3. Department of Water and Environmental Regulation, urban water design website
4. Activity page 1: Urban water design

Steps:

1. Students need to investigate what a liveable city consists of, by watching Ten most liveable cities in the world, followed by the Least liveable cities in the world.
2. Students are to reflect on these videos, outlining the factors influencing a city being 'liveable'. Ask students what factors they would look for in a liveable city for themselves. Students list these factors and discuss.
3. Water Corporation and DWER work closely together to ensure our water is protected, conserved and managed responsibly. To introduce the ideas around WA water management, students will research Department of Water and Environmental Regulation website.
4. Students refer to DWER website to complete the Urban water design activity page.

Clean water for the future

Students will learn about the United Nations' Sustainable Development Goals, delving deeper into clean water and sanitation for global environmental quality. Students will investigate how Water Corporation is committed to ensuring water for the future, designing a 3D model on one of the water supply processes.

Time required:

3 hours

Resources required:

- **iPad or computer per student**
- **Recycled materials to create 3D model**

Preparation:

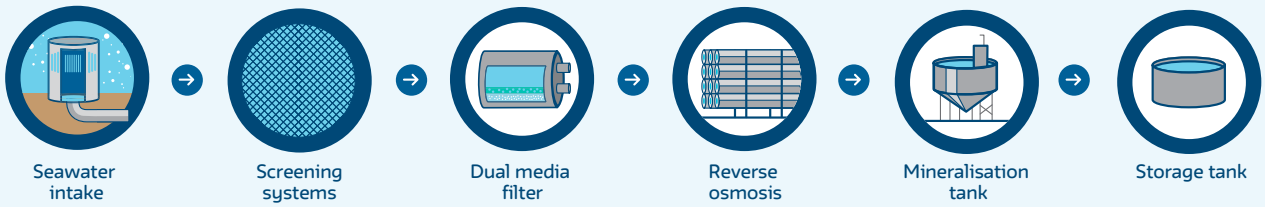
Ensure students have access to:

1. What is sustainable development?
2. Sustainable Development Goal #6 Clean water and sanitation
3. Water Corporation climate change
4. Microsoft PowerPoint
5. Activity page 2: Water treatment process

Steps:

1. Introduce the UN Sustainable Development Goals, watching what is sustainable development?
2. Students are to investigate global environmental quality and liveability through Sustainable Development Goal #6 – Clean water and sanitation.
3. Ask students to research how Water Corporation is doing its part to ensure water for the future. Students visit the climate change webpage to understand how it is facing this challenge. Identify the various ways Water Corporation is sourcing water for Perth.
4. Ask students to choose one of the processes for sustainably sourcing water in Perth. Students may use PowerPoint to collate and present their research.
   a. Describe the steps of the water process in detail, referring to Activity page 2: Water treatment process.
   b. Refer to the targets in Sustainable Development Goal #6 and identify how their chosen process ticks these targets.
   c. Identify other countries utilising the same process for sustainably managing water.
5. Students need to design a 3D model of their chosen method of processing water with labels explaining what happens at each step. They may prefer to work with a partner as they utilise recycled materials.

Desalination



Urban water design

Water Corporation and the Department of Health and Regulation (DWER) work together to ensure WA's water is responsibly protected, conserved and managed. Residential, commercial and industrial developments and associated infrastructure can have significant impacts on water resources. The urban design is a large factor in making a city more 'liveable'.

Instructions

When reading about urban design and water sensitive cities, understanding the vocabulary is important.

1. **Using your own words**, provide a simple definition for each of the following:

Term	Definition
Biofilter	
Infiltration basin	
Innovative	
Integration	
Living stream	
Scheme water	
Sedimentation	
Sustainability	
Urban water cycle	
Urban water management	
Water sensitive urban design	

2. Using the applicable brochure links from the DWER urban water management page, open and carefully read the following information:
   a. Biofilters
   b. Constructed wetlands for stormwater management
   c. Dry or ephemeral detention areas
   d Infiltration basins and trenches
   e. Living streams
   f. Swales and buffer strips

3. Look up a satellite image of your school vicinity to see if you can identify any of the above features in your school's suburb.

4. Take a walk around the outer perimeter of your school grounds to determine if any of the features are present.

Activity page 1: Urban water design - continued

5. What urban water design feature from the DWER brochures could improve your neighbourhood? Explain the positive impacts this feature would create for the local:
   a. Environment
   b. Residents
   c. City council

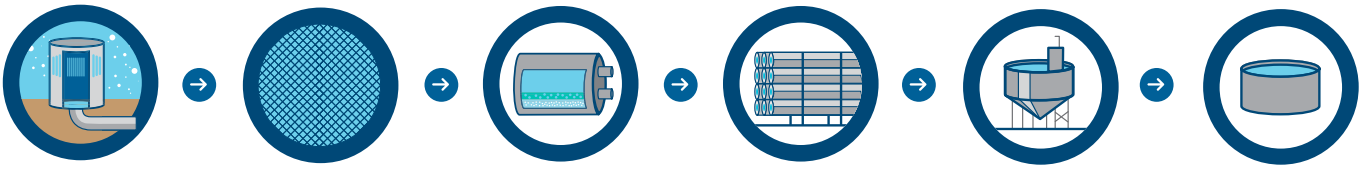
6. Using the below links, research Water Corporation's Drainage for Liveability initiative to understand how the program is transforming Perth into a water sensitive city.
   a. Bannister Creek living stream project
   b. Brentwood living stream project
   c. Morley ninja park media release and video of project
   d. Wharf street basin website and video series of project
   e. Bassendean living stream project

7. Choose ONE of the living stream projects to research further. Prepare a PowerPoint presentation to describe how your chosen program has fulfilled the following criteria:
   - Which urban design features are included?
   - Why have the design features been chosen for this site?
   - What are the benefits to the community (people/plants/urban design)?
   - Are there a number of groups involved in the project? If so, which groups are they, and what is the benefit of involving these groups?
   - From your research, what in particular would make you want to visit this site?

Water treatment process

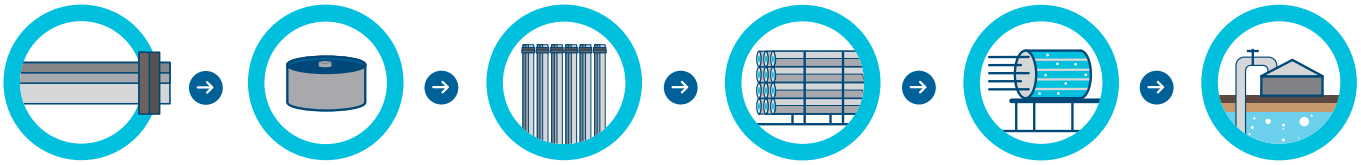
Water Corporation completes the following steps to process our water, ensuring the water is safe and healthy for the community.

Desalination



Groundwater

Groundwater Replenishment



Surface water