

# Unit 1: Water journeys

## Introduction

The earth is almost a closed system. Very little of the earth's matter, including water, is gained or lost from our planet. Water moves around the earth in its various forms—liquid water, solid ice and water vapour. The same water you brushed your teeth with this morning could have been in a lake when the dinosaurs were on earth.

In this unit, students investigate where our water comes from and where it goes. They examine their own and their families' water use, and identify ways in which they can reduce their water consumption. They undertake a challenge to design and create a promotional product, such as a magazine advertisement or digital media product, for the Waterwise marketing campaign targeting the home.

Depending on seasonal conditions, Australians use between 18 and 22 million megalitres of water a year, which is enough to fill Sydney Harbour almost 50 times. One megalitre (a million litres) of water is approximately equivalent to the water that would fill three lanes of a standard-sized Olympic swimming pool.

## Incorporating enterprise learning skills

The design challenge introduces students to enterprise learning skills that are transferable to life outside the classroom. Enterprise education is aimed at developing not just business skills but a broad suite of life and work skills in students.

Enterprise learning skills include:

- accepting responsibility
- working in teams
- being flexible
- communicating effectively
- evaluating
- initiating ideas
- making decisions
- negotiating
- organising and managing resources
- taking and managing risk
- thinking creatively.

**'Enterprise education is learning directed towards developing in young people those skills, competencies, understandings, and attributes which equip them to be innovative, and to identify, create, initiate, and successfully manage personal, community, business, and work opportunities, including working for themselves.'** (Department of Education, Science and Training, 2004)

One effective enterprise learning strategy in this context is to link students with your local council water management program. The student-developed products can be used to promote the council's water conservation strategy, and students have the experience of contributing to a 'real world' Waterwise campaign.

The purpose of this unit is to lay the foundation for student understanding about the processes of the water cycle, both natural and human, so that they will be able to grasp the complexities of effectively managing this important resource now and into the future, and to contribute to the promotion of Waterwise in the community.

## ❖ Essential Learnings for this unit—By the end of Year 7

Ways of working	Knowledge and understanding
<b>Science</b>	
<p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>› collect and analyse first- and second-hand data, information and evidence</li> <li>› draw conclusions that summarise and explain patterns in data and are supported by experimental evidence and scientific concepts</li> <li>› communicate scientific ideas, data and evidence, using scientific terminology suited to the context and purpose.</li> </ul>	<p><b>Science as a human endeavour</b>  <b>Science is a part of everyday activities and experiences.</b></p> <ul style="list-style-type: none"> <li>› Scientific knowledge can help to make natural, social and built environments sustainable, at a scale ranging from local to global.</li> </ul>
<b>Studies of Society and Environment</b>	
<p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>› collect and analyse information and evidence from primary and secondary sources</li> <li>› draw conclusions and make decisions based on information and evidence by identifying patterns and connections</li> <li>› communicate descriptions, decisions and conclusions, using different text types for specific purposes and the conventions of research-based texts</li> <li>› respond to investigation findings and conclusions by planning and implementing actions.</li> </ul>	<p><b>Place and space</b>  <b>Environments are defined and changed by interactions between people and places.</b></p> <ul style="list-style-type: none"> <li>› Australian environments are defined by patterns of natural processes, by human activities and by the relationships between them, including climate and natural resource distribution, resource use, and settlement patterns.</li> <li>› Sustainability requires a balance between using, conserving and protecting environments, and involves decisions about how resources are used and managed.</li> </ul>
<b>Technology</b>	
<p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>› investigate and analyse the purpose, context, specifications and constraints for design ideas</li> <li>› generate and evaluate design ideas and determine suitability based on purpose, specifications and constraints</li> <li>› communicate the details of designs showing relative proportion, using labelled drawings, models and/or plans</li> <li>› select resources, techniques and tools to make products that meet specifications</li> <li>› plan and manage production procedures and modify as necessary</li> <li>› make products to meet specifications by manipulating and processing resources</li> <li>› evaluate the suitability of products and processes for the purpose and context, and recommend improvements</li> <li>› reflect on and identify the impacts of products and processes on people, their communities and environments</li> <li>› reflect on learning, apply new understandings and identify future applications.</li> </ul>	<p><b>Technology as a human endeavour</b>  <b>Technology influences and impacts on people, their communities and environments.</b></p> <ul style="list-style-type: none"> <li>› Product design and production decisions are influenced by specifications, constraints and aspects of appropriateness including functions, aesthetics, ethics, culture, available finances and resources, and sustainability.</li> </ul> <p><b>Information, materials and systems (resources)</b>  <b>The characteristics of resources are matched with tools and techniques to make products to meet design challenges.</b></p> <ul style="list-style-type: none"> <li>› Resources are selected according to their characteristics, to match requirements of design challenges and suit the user.</li> </ul>

## ... Assessment overview

The assessment task for this unit focuses on a design challenge in which students develop a promotional product for good Waterwise behaviours, such as a:

- ◆ community announcement or jingle for radio
- ◆ magazine or television advertisement
- ◆ claymation
- ◆ brochure
- ◆ PowerPoint presentation.

If the students are working in partnership with your local council, the 'product' may be determined by the council's needs at the time, and would need to align with the council's own marketing campaign—the aim or purpose of which should be increasing our water efficiency. A council representative could be invited to talk about their campaign and the strategies they are using, and to work with students to guide their choice of product and key messages.

Alternatively, the target audience for the Waterwise campaign could be the local school community.

The promotional products could include:

- ◆ a jingle in which the students use the melody of a popular song and change the lyrics to a Waterwise message (use Whizzy's jingle as an example)
- ◆ a dance sequence to accompany the jingle, which the student could perform at assembly
- ◆ a community announcement that could be played over the school public address system

- ◆ a magazine advertisement to be published in the school newsletter
- ◆ a television advertisement to be played at assembly
- ◆ claymation
- ◆ PowerPoint presentation
- ◆ a combination of all of the above to be collated for a school assembly education program.

## ... Opportunities for assessment

These involve monitoring students' developing understanding of water and wastewater systems, and their understanding of water as a finite resource. Students' work is to be kept in a journal or theme book as a record of observations, experiences and reflections. Frequent monitoring of these journals allows identification of student alternative conceptions and provides evidence of student learning.

## ... Assessable elements

### » Technology

- Knowledge and understanding
- Investigating and designing
- Producing
- Evaluating

### » Science

- Knowledge and understanding
- Investigating
- Communicating



## ❖ Essential Learnings for assessment—By the end of Year 7

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<b>Technology</b>	
<p><b>Students are able to:</b></p> <ul style="list-style-type: none"> <li>› investigate and analyse the purpose, context, specifications and constraints for design ideas</li> <li>› generate and evaluate design ideas and determine suitability based on purpose, specifications and constraints</li> <li>› communicate the details of designs showing relative proportion, using labelled drawings, models and/or plans</li> <li>› make products to meet specifications by manipulating and processing resources</li> <li>› evaluate the suitability of products and processes for the purpose and context, and recommend improvements</li> <li>› reflect on and identify the impacts of products and processes on people, their communities and environments.</li> </ul>	<p><b>Science as a human endeavour</b></p> <p>Technology influences and impacts on people, their communities and environments.</p> <ul style="list-style-type: none"> <li>› Product design and production decisions are influenced by specifications, constraints and aspects of appropriateness including functions, aesthetics, ethics, culture, available finances and resources, and sustainability.</li> </ul> <p><b>Information, materials and systems (resources)</b></p> <p>The characteristics of resources are matched with tools and techniques to make products to meet design challenges.</p> <ul style="list-style-type: none"> <li>› Resources are selected according to their characteristics, to match requirements of design challenges and suit the user.</li> </ul>

## Unit 1 overview

Phase	Lesson
<b>Engage</b>	
To capture interest and discover what we think we know	› Lesson 1—Water—A precious resource
<b>Explore</b>	
To have shared, hands-on experiences	› Lesson 2—Saving water at home › Lesson 3—Water journeys through our town—Part 1 › Lesson 4—Water journeys through our town—Part 2 › Lesson 5—Exploring our catchment › Optional investigation—How long does water take to soak into different surfaces?
<b>Explain</b>	
To demonstrate what we have learned by exploring	› Lesson 6—Catchments and water cycles › Lesson 7—Water cycle adventure
<b>Elaborate</b>	
To build understanding through an investigation	› Lesson 8—Designing the product › Lesson 9—Creating the product
<b>Evaluate</b>	
To review and reflect on learning	› Lesson 10—Evaluating the product



## ❖ Linking locally

- ◆ Contact your local council water resource management officers about using the student-developed promotional products, such as brochures and posters, in their local Waterwise program. The local council may also be able to organise a visit to local water treatment plants.
- ◆ Invite a guest speaker from the community to talk about the water supply in your community. The guest speakers could be education officers or water resources staff from your local council, or representatives from the Department of Environment and Resource Management, Queensland. They could explain the monitoring of water quality, the sources of water, water treatment processes, and the distribution of drinking water in your community.
- ◆ The local community elders could be invited to provide a relevant Indigenous perspective about how local Indigenous people found and used water. For protocols explaining how the visit should be organised, go to page 22 of *Embedding Aboriginal and Torres Strait Islander Perspectives in Schools* at <http://education.qld.gov.au/schools/indigenous/docs/indig-persp.pdf>.

## ❖ Taking action

Students take action by promoting responsible Waterwise behaviours to other school students and to the community on behalf of the local council. They display or distribute water-saving promotional materials to their school and local community.

## ❖ Bibliography

DEST (2004) *Enterprise Education—Findings from the project: Action Research to Identify Innovative Approaches to, and Best Practice in, Enterprise Education in Australian Schools* [online]. Available at [www.dest.gov.au/NR/rdonlyres/594D2C1D-F832-4A96-B30F-99D052D6EFAF/2601/enterprise\\_education\\_report.pdf](http://www.dest.gov.au/NR/rdonlyres/594D2C1D-F832-4A96-B30F-99D052D6EFAF/2601/enterprise_education_report.pdf).

Ryan, T. *Thinking keys*. CD-ROM.  
[www.tonyryan.com.au](http://www.tonyryan.com.au)

# Resource 1

## ❖❖❖ 'Saving water at our school' report plan (Assessment task)

### Unit 1: Water journeys

#### » Setting the scene

Many local communities in Queensland face on-going water shortages due to changing climate patterns, or increases in population, or both. Everyone in the communities affected needs to use water more efficiently so it does not run out. Even where there are no water shortages, it is important to use this precious resource efficiently. This will help the environment (and can also save money in the home).

In this task, you will work with a team to investigate, design and create a promotional product that encourages people in your community to save water. To create the product, you will investigate where our water comes from, how it is treated, and how everyone can save water. You will gather data about water use behaviours of families in your class to create your product (by conducting a water use audit).

You will document your product development, including all phases of the design process, in a design folio and your student journal. You will evaluate your design process as well as your product, including how effective it was in changing water use behaviours and attitudes of family members in your class.

#### » Purpose of the task

For you to show how well you can:

- › gather information through background research, and analyse and draw conclusions from home water audit data
- › design, create and evaluate a product to promote water saving in the homes of your local school community
- › show your understanding of how the 'water cycle with human impacts' works in your local area.

#### » Products to be completed

1. Working in a team, you will design, create and evaluate a promotional product promoting Waterwise behaviours in the home.
2. Working independently, you will document your product development including all phases of the design process (investigation, ideation, production, evaluation).
3. Working independently, explain how the 'water cycle with human impacts' works in your local area. Include your analysis of data gathered from a water use audit and the conclusions you drew based on that data.

