

# Year 7

## Lesson 7

### Water for all: Managing water supplies in SEQ

[www.logan.qld.gov.au](http://www.logan.qld.gov.au)

#### Learning objectives

Students will be able understand:

- The demands currently placed on water supplies
- The environmental and social pressures impacting on water supplies in the future
- The role of technology in reducing impacts associated with ensuring adequate water supplies
- Along with technology water supplies can be managed through strategies associated with economics, education and other drivers of behaviour.

#### Learning outcomes

Subject	Strand & Content Descriptors
Science	<p>Science Understanding</p> <ul style="list-style-type: none"> <li>• Water is an important resource that cycles through the environment (ACSSU222)</li> </ul> <p>Science as a Human Endeavour</p> <ul style="list-style-type: none"> <li>• Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations (ACSHE120)</li> <li>• Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management (ACSHE121)</li> </ul> <p>Science Inquiry Skills</p> <ul style="list-style-type: none"> <li>• Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (AC SIS133)</li> </ul>
Geography	<p>Geographical Knowledge and Understanding</p> <ul style="list-style-type: none"> <li>• Water is a resource that links places together as it moves through the water cycle</li> <li>• Water is a difficult resource to manage because it moves through the environment, is an essential but shared resource, has competing uses and is highly variable over space and time</li> <li>• There are several strategies for increasing water supply and reducing water use, such as dams, desalination, charging higher process, aquifer recharge and storage, recycling, changing the uses of water, and trade in virtual water</li> </ul> <p>Geographical Skills and Inquiry</p> <ul style="list-style-type: none"> <li>• Develop geographical texts using appropriate geographical vocabulary, concepts and geographical conventions to communicate effectively in one or more of the following forms: written, oral, visual and graphic</li> <li>• Select appropriate methods, including the use of ICT to display data in graphs, tables, maps or statistics</li> <li>• Select key findings from an inquiry to inform decisions on how to best respond to the question, issue or problem and where appropriate, plan for action</li> </ul>



### Important Questions

- Why is it important to investigate opportunities to access or develop water resources that are not solely reliant on rainfall?
- Will technological solutions, such as desalination, effectively drought proof communities in the future?
- Why is it important to tackle water management and supply issues in a diverse and integrated way?
- What is virtual water?

### Lesson Plan

The premise for this lesson can be established through the delivery of a case study (delivered in the form of a news bulletin or a press release from the Minister for Energy & Water Supply for example).

The case study should state that the region is facing a severe crisis as water resources required for domestic and industrial and horticultural use are diminishing; the reasons for the shortage could include the following:

- Reduced rainfall associated with a prolonged drought with consequent falls in major dams to less than 25% of capacity
- Increasing population pressures in key areas that are placing pressure on water supplies and water supply infrastructure (reservoirs, pumps, treatment plants etc.)
- Current daily consumption per person is on average 300 litres per day; the minister suggests this needs to be reduced by 50%
- Additionally, there are community concerns regarding the siting of and costs associated with a proposed new dam and the impacts associated with disposing of treated wastewater into local waterways, including the ocean.

As a group or in small groups, students are asked to suggest ways to overcome the water crisis; these should be recorded and displayed and categorised according to type where possible. It is likely that technological solutions such as desalination or new dams will be prominent.

Using the list of technological solutions as foundation, students undertake self-directed research identifying key facts about a chosen technology and present these in a 'marketing' document that promotes the adoption of the chosen technology, including the following information:

- An explanation of how the technology works, including diagrams, photographs and other images
- Information on the capacity of the technology to provide additional water supplies or reduce pressure on existing supplies
- Requirements to establish and maintain the technology (essentially a cost/benefit analysis: for example the cost to build; natural resources such as land required; energy to run the technology; savings in other areas; long term security of water supply).

Technologies investigated by students could include: desalination; various uses and types of recycled water; aquifer recharge and storage; sourcing water from other regions and transporting by pipeline or similar; building new dams.



[www.logan.qld.gov.au](http://www.logan.qld.gov.au)

Ask the students to consider whether the technology they researched solves the water crisis?

For example does it assist or encourage people to use less water; does it reduce environmental concerns described above or pose new ones?

Introduce the concept of the 5 E's of Demand Management and provide some relevant examples for each.

- Engineering (Technology) - as investigated
- Education - giving information to the community to help them understand how they use water and make changes
- Enforcement - enforcing standards, such as the use of dual flush toilets or use of rainwater tanks
- Economics - financial incentives associated with the price of water
- Encouragement - rebates for washing machines and toilets

Students identify aspects associated with the 5E's that can complement or add value to their preferred technological solution, providing a rationale for the addition on non-technological management strategies. This information is added to the original case study.

### **Resource Requirements**

Access to the internet or other resource materials as required

### **Additional Activities**

Global studies: how are other countries in our region managing water supplies? Do they face similar issues as those in South East Queensland? An internet search using the terms 'Managing water supplies' with the addition of a regional country or city (Singapore, Jakarta, Auckland, Bangkok) would provide useful initial data.

Virtual water: all the products or services we use require water; for example it takes around 10,000 litres of water to produce 1 kilogram of beef. In this case countries that produce large quantities of beef for export (Australia, United States, and Argentina) are exporting millions of litres of water every year. This is referred to as virtual or hidden water.

Students identify the volume of water required to produce a number of products, including foodstuffs such as wheat, rice and eggs and other consumables such cars and clothing. Information is presented in a chart or similar. What goods are imported into Australia that contains high volumes of virtual water?

(Information on <http://www.unwater.org/worldwaterday/campaign.html> may assist students).