

Year 7

Lesson 6

Spatial distribution of water

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Learning Objectives

Students will be able understand:

- The availability and use of fresh water resources varies throughout the world
- Similarities associated with sustainable water management in Australia and a location in the developing world
- Specific factors impacting on sustainable water management in a location in the developing world.

Learning outcomes

Subject	Strand & Content Descriptors
Science	<p>Science Understanding</p> <ul style="list-style-type: none"> • Water is an important resource that cycles through the environment (ACSSU222) <p>Science as a Human Endeavour</p> <ul style="list-style-type: none"> • 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) • Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management (ACSHE121) <p>Science Inquiry Skills</p> <ul style="list-style-type: none"> • Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate (ACSIS133)
Geography	<p>Geographical Knowledge and Understanding</p> <ul style="list-style-type: none"> • Environmental resources (including renewable, non-renewable and continuous resources) have different characteristics that affect their use and significance • Water is a resource that links places together as it moves through the water cycle • 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 • The distribution, availability and uses of fresh water vary throughout the world • 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 <p>Geographical Skills and Inquiry</p> <ul style="list-style-type: none"> • Develop geographical texts using appropriate geographical vocabulary, concepts and geographical conventions to communicate effectively in one or



	<p>more of the following forms: written, oral, visual and graphic</p> <ul style="list-style-type: none"> • Select appropriate methods, including the use of ICT to display data in graphs, tables, maps or statistics • 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
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Important Questions

- What factors influence the distribution and availability of fresh water sources throughout the world?
- Are fresh water resources in the developing world managed in the same way as resources in South East Queensland or Australia?
- Can knowledge or expertise from Australia assist in more sustainable management of water resources elsewhere in the world?

Lesson Plan

This lesson engages students in an assessment of water resources and management in a region of the developed world. Information and data collected is compared with similar issues in Australia to produce a report that includes recommendations and rationale that will improve sustainable management of water resources in a selected region of the developed world.

Water scarcity is both a natural and a human-made phenomenon. There is enough freshwater on the planet for six billion people but it is distributed unevenly and too much of it is wasted, polluted and unsustainably managed. Reinforce key concepts of the water cycle relevant to this area of study (for example most of the Earth’s water supplies are unavailable for use as they are either saltwater or ice. Climatic conditions can influence the extent of fresh water resources over time).

Ask students to identify continents or countries that they think would have greater or less available fresh water resources than Australia.

Students undertake research to identify and select a regional centre or rural place in Asia or Africa that has some demographic and other similarities to familiar Australian locations; for example it should support a reasonably sized, sedentary population and utilise water for a range of purposes including domestic, horticultural/agricultural and ‘industrial’ purposes.

In the first stage, students identify suitable resources and techniques to enable identification of the major water sources (rivers, dams, groundwater) utilised in the location. Using Edit or similar functions in Google Maps/Earth or other ICT programs, students develop a map that shows key information related to water resources and use, for example:

- Location of water resources
- Capacity of water storages



- Current status and health of water resources (e.g. health of waterways; fullness of dams or other storages).

This information should then be considered in light of a range of demographic, climatic and water management information that should be collected analysed and added to the map or used in accompanying documentation, for example:

- Size of the population accessing resources
- Annual rainfall or other relevant meteorological statistics (e.g. period of monsoon; recent droughts)
- Key uses of water resources (including for non-domestic purposes)
- Water treatment and delivery systems (e.g. how people receive water, how is it cleaned, how is it disposed of)
- Water management arrangements (e.g. is the resource shared by multiple countries; is some of the resource diverted for other use before it reaches the location).

Using the data and information collected, students develop a report on the status of water resources in their selected city that focuses on identifying threats and incorporating management strategies to strengthen the sustainable management and use of water resources. Students could consider:

- Current and future impacts on water resources: for example, significant increases in population; sustained drought; diminished quality of water resources; diversion of water resources by neighbouring regions/countries
- Opportunities to improve water resource availability and management and subsequent outcomes: for example benefits (economic/social/environmental) associated with improved water treatment and/or access to clean water; utilising additional water resources or reuse of current resources through technological or other means
- Assistance: Identifying resource, expertise or other means that could assist the location in improving water management systems including assistance that could be provided from Queensland or Australia as a result of relevant water management initiatives.

Resource Requirements

Access to resource materials, including the internet and relevant ICT programs as required

Additional Activities

2005-2015 is the International Decade for Action – ‘Water for Life’, the United Nations Environment Program website at <http://www.un.org/waterforlifedecade/scarcity.shtml> has a range of maps and information that can add value to aspects of this lesson. The site also includes dedicated pages for school students including games and other materials.