

Geography: Comparing Australia and Arab water management

This PDF is interactive. Click on underlined words and sentences to be directed to online resources.

RESOURCE OVERVIEW

This resource presents two teaching ideas that support the Australian Curriculum for Year 7 Human and Social Sciences (HASS) F-6/7 and Year 7 Geography F-10 by comparing water management in Australia and North Africa (Arab countries).

1. Comparing Arab and Australian environments

Builds student knowledge of the environmental and hydrological impacts on water quality and availability.

2. Water sources and management

Compares water sources from the Arab world to the Great Australian Basin and examines water management systems in Australia and the Arab region and assesses the sustainability of these systems.

The first teaching idea explores the location, environmental and hydrological impacts on water availability in Australia and the Arab region. Students will draw comparisons to the environmental and climactic challenges that affect water availability and quality in both regions. It also examines traditional methods of survival in a desert environment by the Bedouin and Aboriginal Peoples.

The second teaching idea examines water management systems in Australia and in the Arab region and assesses their sustainability.

Both of these teaching ideas provide Year 7 students with important and familiar contexts to extend their understanding of water in the world. Many of the activities have been adapted from the 'Arab Gateways—Sustainable water use' website. Some of these teaching ideas require access to digital projection technology. Hard copy worksheets can be printed.

The teaching ideas offer students opportunities to:

- brainstorm, generate and discuss ideas as a class group
- conduct independent and group research
- analyse data
- analyse articles and video clips.

Both of these teaching ideas are relevant to the Year 7 Geographical Knowledge and Understanding content descriptions for Unit 1 'Water in the world'. They specifically address Geographical Inquiry and Skills content descriptions for Year 7 and also incorporate key ideas from the cross-curriculum priority of Aboriginal and Torres Strait Islander histories and cultures.

AUSTRALIAN CURRICULUM¹ YEAR 7 HUMAN AND SOCIAL SCIENCES (HASS F-6/7 - GEOGRAPHY) LINKS

Knowledge and Understanding

- Unit 1: Water in the world

The classification of environmental resources and the forms that water takes as a resource (ACHASSK182)

The quantity and variability of Australia's water resources compared with those in other continents (ACHASSK184)

The nature of water scarcity and ways of overcoming it, including studies drawn from Australia and West Asia and/or North Africa (ACHASSK185)

The economic, cultural, spiritual and aesthetic value of water for people, including Aboriginal and Torres Strait Islander Peoples and peoples of the Asia region (ACHASSK186)

AUSTRALIAN CURRICULUM YEAR 7 GEOGRAPHY (7-10) LINKS

Geographical Knowledge and Understanding

- Unit 1: Water in the world

The classification of environmental resources and the forms that water takes as a resource (ACHGK037)

The quantity and variability of Australia's water resources compared with those in other continents (ACHGK039)

The nature of water scarcity and ways of overcoming it, including studies drawn from Australia and West Asia and/or North Africa (ACHGK040)

The economic, cultural, spiritual and aesthetic value of water for people, including Aboriginal and Torres Strait Islander Peoples and peoples of the Asia region (ACHGK041)

Aboriginal and Torres Strait Islander histories and cultures cross-curriculum priority

TEACHING IDEAS

1. COMPARING ARAB AND AUSTRALIAN ENVIRONMENTS

Students explore the location, environmental and hydrological impacts on water availability in Australia and the Arab region. They study physical, topographical and climate maps to gain a greater understanding of the climactic and physical features that impact water supply and use in these regions. Students also examine traditional survival methods in these regions which were largely based on locating water. Students will investigate how the Bedouin and Australian Aboriginal Peoples survived in these regions before modern water management systems were introduced.

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Activities

- a. Comparing Arab and Australian environments
- b. Desert survival

1a. Comparing Arab and Australian environments

Students use digital technologies to conduct research about the quantity and variability of water in the Australian and the Arab regions. They compare similarities and differences between the Australian environment, climate and water availability to that of the Arab region (ACHASSK185; ACHGK040).

1. Display a map of the world and ask students to identify countries in the Arab region that are the focus of their study. These countries include: Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestinian Territories, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen.
2. Students to predict the type of climate in these counties then display a [Worldwide climate classifications](#) (see footnote 2) map to check their predictions. Ask students to compare the climate of the Arab region with that of Australia and discuss their observations.
3. Display the [Aqueduct water risk atlas](#) (see footnote 3) and compare the two regions for water related risks. This map shows a visual representation of the relative risk for each region regarding access to the world's water. What similarities do students see between Australia and the Arab region? Ask students to suggest reasons for these findings.

Ask students to conduct their own research and write a summary comparison on the Arab region and Australia by viewing:

- [Macroclimates of the Earth](#) (see footnote 4)
- [World desert map](#) (see footnote 5)
- [World rainfall map](#) (Countries by average annual precipitation) (see footnote 6)
- [World's renewable water supply map](#) (Total renewable water resources per capita by country) (see footnote 7)

4. Using the [Water resources \(freshwater\) map](#) (see footnote 8), ask students to locate freshwater supplies in Australia and the Arab region. Discuss how the freshwater supply of the Arab region and Australia compares to the rest of the world. Ask students to predict the most pressing issues that this map illustrates in these two regions.

1b. Desert survival

Students investigate and compare how traditional Aboriginal Peoples of the Alice Springs desert and the Bedouin people of the Arabian and Syrian regions have survived in the desert by locating water (ACHASSK185/ACHGK041).

2 Wikipedia (Worldwide climate classifications) <https://en.wikipedia.org/wiki/Climate#/media/File:ClimateMap_World.png>

3 World Resources Institute (Aqueduct water risk atlas) <<http://www.wri.org/resources/maps/aqueduct-water-risk-atlas>>

4 Wikimedia Commons (Macroclimates of the Earth) <<https://commons.wikimedia.org/wiki/File:K%C3%B6ppen-vereinfacht.svg>>

5 National Geographic (World desert map) <<http://environment.nationalgeographic.com.au/environment/habitats/desert-map/>>

6 Wikipedia (Countries by average annual precipitation – Atilia Kagan) <https://en.wikipedia.org/wiki/Precipitation#/media/File:Countries_by_average_annual_precipitation.png>

7 ChartBins (Total renewable water resources per capita by country) <<http://chartsbin.com/view/1470>>

8 Worldmapper (Water resources) <<http://www.worldmapper.org/display.php?selected=102#>>

1. Ask students to read the information about desert survival of the Bedouin and Australian Aboriginal people who lived in the desert on page 24 of the [Arab Gateways—Sustainable water use](#) resource (see footnote 9).
2. To further understand the survival techniques of the Bedouin and Aboriginal people, students view the online information on [Desert survival](#) (see footnote 10) and [Kwatye - Water](#) (see footnote 11), detailing the Aboriginal people from Alice Springs quest for water in the desert. Note that downloading or displaying information for educational use from both these websites may infringe their copyright terms of use.
3. Suggest two reasons why each group developed a range of techniques for survival in the desert.

2. WATER SOURCES AND MANAGEMENT

Students compare water sources from the Arab world with water sources in the Great Artesian Basin and examine water management systems in Australia and the Arab region to assess the sustainability of these methods.

Activities

- a. Water sources
- b. Water case study
- c. Water management

2a. Water sources

Students discover the different water sources accessed in the Arab region and in the Great Artesian Basin in Australia. They investigate the positive and negative impacts on these water sources (ACHASSK185/ACHGK040).

1. As a class, read the information about water sources in the Arab region on pages 27-30 of [Arab Gateways – Sustainable water use](#).
2. List the different types of water sources.
3. What are the positive and negative impacts of building dams in areas of such variable rainfall and high evaporation?
4. Why is groundwater considered to be a non-renewable resource?
5. As a class, read the information in [The world's largest aquifer](#) (see footnote 12) and view the video [Water down under—The Great Artesian Basin story](#) [32:43] (see footnote 13). This video explains how groundwater forms and details how Australia's largest aquifer stores water. It also describes how the basin was valuable to Indigenous Australians. (Note: This video is 32 minutes long. If time does not permit viewing the entire video, the first eight to ten minutes will be most valuable in assisting students to answer the questions.)
6. Ask students to draw a labelled diagram of an aquifer, adding a detailed description about how aquifers are formed and how water is accessed from them.

2b. Water case study

Students examine water systems used in countries in the Arab region. Each case study provides students with an understanding of the impacts on water supply, economy and the environment (ACHASSK183/ACHGK038; ACHASSK184/ACHGK039; ACHASSK185/ACHGK040).

9 Commonwealth of Australia (Arab Gateways) <http://www.arabgateways.edu.au/verve/_resources/Unit2_SustainableWaterUse_Student_file.pdf>

10 Public Broadcasting Service (Lawrence of Arabia – Desert survival) <<http://www.pbs.org/lawrenceofarabia/revolt/water.html>>

11 Northern Territory Government (Kwatye – water) <<http://www.alicespringsdesertpark.com.au/kids/culture/kwatye.shtml>>

12 Government of Australia (The world's largest aquifer) <http://www.arabgateways.edu.au/verve/_resources/StudentActivitySheet_12_WorldsLargestAquifer.pdf>

13 Government of Australia (Water down under – The Great Artesian Basin Story) <<https://www.youtube.com/watch?v=VB4HFHDdzUc>>

1. Download the [Water case studies](#) (see footnote 14) worksheet from the Arab Gateways - Sustainable water use website. Students read and list the management strategies used in each country.
2. Students evaluate how sustainably each of the four countries discussed in the case studies is using their water. They also explain how each country's use of water could impact the future of their water supplies. Students then rank the countries from best to worst in relation to how sustainable they are managing the water supplies, providing a detailed explanation for their reasoning.
3. Using the internet, students research and write a brief definition of each of the following systems of water management. They must include the positive and negative impacts and comment on the sustainability of each system.
 - rainwater collection
 - qanats
 - water recycling
 - desalination
 - transporting water
 - water reallocation
 - efficient irrigation
 - bore water
4. Using the [Diamond ranking chart](#) (see footnote 15) from the 'Arab Gateways—Sustainable water use' website (see footnote 16), students rank water management systems and compare them with their peers. As a class, discuss any similarities and differences. (Note: Instructions are on page 41 of 'Sustainable water use' student file.)
5. Divide the class into three affirmative and three negative teams to prepare and debate the following topics:
 - Agriculture should cease in dry areas.
 - Water is the most valuable resource in the Arab region, more precious than oil.
 - Water restrictions should be permanently in place in dry regions such as the Arab region and Australia.

14 Government of Australia (Water case studies) <http://www.arabgateways.edu.au/verve/_resources/StudentActivitySheet_13_WaterCaseStudies.pdf>

15 Government of Australia (Diamond ranking chart) <http://www.arabgateways.edu.au/verve/_resources/StudentActivitySheet_14_DiamondRankingChart.pdf>

16 Government of Australia (Sustainable water use) <<http://www.arabgateways.edu.au/sustainable-water-use.html>>



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