

# Geography: Managing our stormwater

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

## RESOURCE OVERVIEW

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This resource presents two teaching ideas that support Australian Curriculum Year 7 Geography outcomes in the context of stormwater management.

### **1. School stormwater audit**

Explores urban stormwater as a water resource and how it connects places including how it flows through the school grounds.

### **2. Collecting and using stormwater**

Investigates possible solutions for managing the impacts of stormwater.

The first teaching idea outlines activities that provide students with an understanding of what stormwater is and how it flows through urban environments. While the second teaching activity provides students with an opportunity to research how stormwater is managed and re-used. Students also design their own water-sensitive school.

The teaching ideas offer students opportunities to:

- brainstorm, generate and discuss ideas
- research innovations in stormwater management
- conduct a survey
- analyse video clips
- design their own water-sensitive school.

Some access to digital projection technology is needed. Hard copy worksheets can be printed.

### **AUSTRALIAN CURRICULUM<sup>1</sup> 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 ways that flows of water connect places as it moves through the environment and the way this affects places (ACHASSK183)

#### **Sustainability cross-curriculum priority**

## 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 ways that flows of water connect places as it moves through the environment and the way this affects places (ACHGK038)

### Sustainability cross-curriculum priority

## TEACHING IDEAS

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### 1. SCHOOL STORMWATER AUDIT

Students investigate stormwater and the urban water cycle by conducting an audit of the stormwater systems at their school. They also map stormwater drains and identify their possible impacts (ACHASSK182/ACHGK037; ACHASSK183/ACHGK038).

Activities

- a. Understanding stormwater
- b. School stormwater audit

#### 1a. Understanding stormwater

Students gain an understanding of stormwater and how the urban water cycle interacts with the natural water cycle.

1. Explain that stormwater is mainly surface water that collects from rainfall that runs off buildings, roads and hard surfaces such as car parks. It also comes from farms, gardens, parks and other open space areas. Stormwater is usually collected by stormwater drains and transported through pipes and channels to creeks, rivers and the ocean. Stormwater is not treated before it reaches waterways.
2. As a class, read and discuss the information on stormwater management and the urban water cycle in your local area. It can be sourced from your water utility or local council. For example, [the urban water cycle](#) (see footnote 2) can be found on the Sydney Water website. Ask students to summarise the information and research definitions for any new vocabulary.
3. Display the image of [the natural and urban water cycles](#) (see footnote 3) for the class to view. Ask students to compare the natural water cycle and the urban water cycle diagrams. Discuss what issues are created in the urban water cycle.

#### 1b. Stormwater audit

Students conduct an audit of stormwater drains in and around the school grounds, discussing various issues that can happen with drains in an urban environment.

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2 Sydney Water (Urban water management) <<http://www.sydneywater.com.au/SW/education/Watermanagement/Urbanwatermanagement/index.htm>>

3 Wyong Shire Council (The natural and urban water cycles) <<http://www.blueplanet.nsw.edu.au/year-7-and-8-natural-and-urban-water-cycles.aspx>>

1. Ask students to brainstorm possible issues we face with stormwater. Display or make a copy of the list to continue adding to it after the stormwater audit is completed by the class.
2. Prepare copies of the [Stormwater audit: how to do a stormwater audit](#) (see footnote 4) worksheet for students to complete in groups. (The worksheet is on page 3 of the resource.)
3. Print a copy of your school map (an aerial map is ideal if available) and local community area. Screenshots of Google maps are useful but ensure that you follow Google's terms and conditions of use. Divide students into small groups for a discovery walk around the school grounds identifying stormwater collection points. Point out any other water related systems along the way such as water tanks, wastewater pipes and water supply to the school. The school grounds-staff are usually good sources of stormwater information.
4. Students mark these points on the school map and take note of the contours of the environment, placing arrows on the map to indicate the directional flow of stormwater run-off into stormwater drains.
5. Return to the classroom and discuss each group's results. Add to the list of stormwater issues identified and discuss their impact on waterways and adjacent marine environments.

## 2. COLLECTING AND USING STORMWATER

Students work in groups to research a stormwater solution and prepare a presentation for the class on their topic. The class will discuss how these solutions could be used to change their school's current stormwater management strategies to create a water-sensitive school (ACHASSK183/ACHGK038).

- a. Explain to the class that scientists and geographers have been working on solutions to the issues surrounding stormwater for many years and that they will be given a stormwater solution to research in groups.
- b. Divide students into five groups. Each group is responsible for researching and preparing a presentation between four to seven minutes long on an allocated topic (see below). Students should clearly explain their stormwater solution concept, collect a word bank of new terms with definitions and create a fun and engaging presentation on their topic to inform their peers.

### Group 1: Harvesting stormwater

Students view the ABC BTN video [Stormwater harvesting](#) [3:25] (see footnote 5). This video provides information on how we can use wetlands to naturally treat captured stormwater and how that water can be re-used. Students then conduct their own research on how stormwater can be harvested in their city.

### Group 2: Wetland filters

Students view the ABC Splash video [Wetlands clean up stormwater](#) [3:02] (see footnote 6) which examines how a Salisbury wetland in South Australia is used to manage and clean stormwater. Students then conduct their own research on how wetlands in their state can aid in stormwater management.

### Group 3: Re-using stormwater

Students view the ABC Splash video [Turning stormwater into groundwater](#) [2:44] (see footnote 7) which investigates how stormwater in Sydney is captured and stored as groundwater where it is filtered naturally for human use. Students then conduct their own research into re-using stormwater in their city, either for a single suburb or council area, or as a part of a city-wide plan.

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4 Sydney Water (Stormwater audit) <[http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq2/-edisp/dd\\_046703.pdf](http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq2/-edisp/dd_046703.pdf)>

5 Australian Broadcasting Commission (Stormwater harvesting) <<http://www.abc.net.au/btn/story/s2527215.htm>>

6 Australian Broadcasting Commission (Wetlands clean up stormwater) <<http://splash.abc.net.au/home#!/media/30834/>>

7 Australian Broadcasting Commission (Turning stormwater into groundwater) <<http://splash.abc.net.au/home#!/media/29880/turning-stormwater-into-groundwater>>

#### **Group 4: Raingardens**

Students view the [10,000 raingardens-helping tackle stormwater pollution in Melbourne](#) video [2:14] (see footnote 8). This video outlines what raingardens are, what they do and how they can be incorporated into backyard landscapes. Students then use the information on the web page to conduct their own research into raingardens and how they help with stormwater management.

#### **Group 5: Water sensitive urban design**

Students view the video [Water for liveability](#) [3:09] (see footnote 9) published by the Central West Local Land Services in NSW. This video explains the growing need for change in urban design planning and how the sustainable management of water in urban environments can solve some of the issues facing water in the urban environment. Students then conduct their own research into water-sensitive urban design in their home city.

c. As a class, discuss how you can make your school more water-sensitive, the benefits and challenges of each solution and how they could be incorporated into a water-sensitive design for the school.

#### **Extension Activity**

Using a school map and information gained from their research, students design their own modifications to make their school more water-sensitive.

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8 Melbourne Water (10,000 raingardens) <<https://www.youtube.com/watch?v=4pz8vHuGEHs>>

9 Central West CMA (Water for liveability) <<https://www.youtube.com/watch?v=-2h7jMlb5xk>>



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