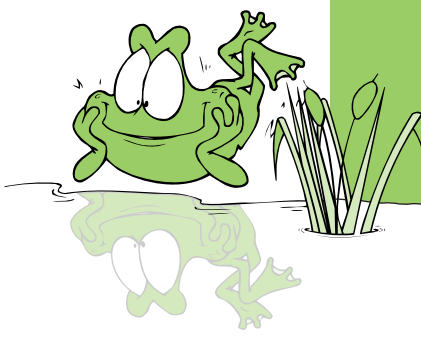
SOSE - Contents



Scrutinise The Schoolyard

I

FOCUS

How/where does our schoolyard create stormwater?
What pollutants might we be contributing?

OBJECTIVES

Construct a map of the schoolyard
Identify possible sources of stormwater pollution

CSF II LINKS

SOSE
4.1 / 4.3 Geography
MATHS
4.4 Space

BACKGROUND INFORMATION

Your schoolyard is in a catchment. A catchment is an area where water drains to one point. There may be more than one catchment within your school grounds. Identifying the features of your catchment assists you to understand: urban stormwater sources; where your stormwater flows; potential pollution hotspots; and downstream impacts.

NOTES

This activity is best completed at the commencement of your stormwater studies. Construction of a school map will be useful in later lessons eg. the Science activities *'Runoff Rates'*, *'Waste Watching'* and *'Runaway Rain'.*

LEARNING TASKS

1/ Assist students to make a map from a birds-eye view of the schoolyard. This can be approached in several ways:

- sketches based on estimates of size and distance
- students pacing distances and using a scale to draw landmarks and features
- work collaboratively in small groups to produce individual maps or a group map of the schoolyard
- students work in small groups on one section of the yard with all maps being joined later

2/ Ensure maps include the following features:

- built features including classrooms, bike sheds, toilet blocks, ashphalt areas, ovals, playground equipment, garden beds, number and location of rubbish bins, seats
- natural features including trees, bushland, creeks, wetlands

3/ Discuss with students key elements of maps including titles, key scale and labeled features.

4/ Additional details may be inserted as stormwater studies continue. Students may add these details onto maps, onto photocopies of their maps or, onto overhead transparency overlays!

MATERIALS

- ***'Scrutinise The Schoolyard'* Student Worksheet**
- **Graph paper**
- **Rulers**
- **Pencils**
- **Erasers**
- **Measuring tapes, trundle wheels**

EXTENSION

To conclude your stormwater studies, revise the schoolyard map. Challenge students to make design changes to the schoolyard to minimise stormwater runoff and reduce pollution.

ASSESSMENT

Were students able to accurately represent man-made and natural features on their map, taking size and location into account?

Scrutinise The Schoolyard - Student Worksheet

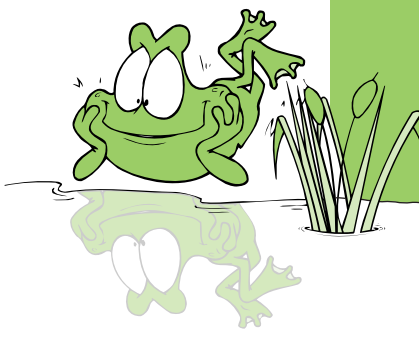
Name:

Your schoolyard is part of a catchment. In a catchment, all water drains to one waterway. In an urban environment, catchments produce a lot of stormwater runoff. The man-made and natural features within your school boundary affect the way rain behaves as it flows through your school. More importantly, the way you care for your school can have a dramatic effect on the water leaving your school, and pollution of local waterways.

To 'Scrutinise Your Schoolyard', your map must be a minature version of what you see every day.

You must take care to mark all of the following features as accurately as you can:

- **classrooms**
- **bike sheds**
- **toilet blocks**
- **canteen**
- **library**
- **multi-purpose room**
- **shade shelters**
- **asphalt areas**
- **concrete / dirt / gravel paths**
- **grassed ovals**
- **playground equipment**
- **garden beds**
- **rubbish bins**
- **seats**
- **trees**
- **creeks or wetlands**
- **outdoor eating areas**
- **play areas**
- **fences**



Successful Strategies

M

FOCUS

- How is Australia addressing stormwater issues?

OBJECTIVES

- Understand that stormwater can be managed
- Develop a positive outlook for the future

CSF II LINKS

SOSE
- 4.2 / 4.3 Geography
- 4.1 Economy & Society

HPE
- 4.2 Health of Individuals & Populations

BACKGROUND

State and Federal Governments are providing significant funding sources to reduce the impact of urban centres on the environment across Australia. In Victoria, the State Government committed $22 million over three years to reduce stormwater pollution. The campaign includes education, changes to Council practices, treatment devices, planning and source controls.

NOTES

This activity is important for students to develop a feeling that the future is not all doom and gloom and that stormwater can be managed and utilised. It acknowledges that across Australia scientific and technological advances are changing our practices.

LEARNING TASKS

Four success stories have been provided that give accounts of how councils throughout Australia are developing innovative new ways to manage stormwater and use it to their advantage. These stories can be photocopied as is and distributed to students or made into individual cards.

1/ Instruct students to complete comprehension tasks with all four articles.
- You may undertake a jigsaw session where individuals are assigned one article and share their findings with the rest of their group.

2/ Students read an article and extract the details required to complete each section of the notetaking table. Particular attention should be paid to the use of key words.
- Encourage students to add personal comments about each article.

3/ To share findings, an informal oral summary can be relayed.
- Students form pairs and take on roles of interviewer and interviewee. Using the information they've gained, role-play to share details with the class.
- These interviews / informal oral summaries could be utilised as an oral note-taking exercise. Students take notes to insert into blank boxes in their note-taking table and learn of other successful strategies.

MATERIALS

- ***'Successful Strategies'*** **Student Worksheets** (enlarge to A3)

EXTENSION

Invite a local council representative to talk about stormwater issues particular to your region and the management strategies being employed to reduce pollution and its impacts.

ASSESSMENT

Were students able to locate information in text and extract the necessary details to complete the table? Could they recall and relay that information in an oral presentation?

Penguin Parade

A $12 million study by the CSIRO has identified stormwater pollution as the major threat to Melbourne's Port Phillip Bay. Local Waterwatch groups fear that a fairy penguin colony near St. Kilda is threatened by stormwater flows containing high levels of dissolved oxygen and nitrates.

With the help of $267,000 from the Commonwealth's Urban Stormwater Initiative, the City of Port Phillip and Inkerman Developments are working to protect their precious marine environment.

A former council works depot site at St. Kilda will be transformed into a water sensitive urban housing estate known as the 'Inkerman Oasis'.

Stormwater will be treated (cleaned) by filters and combined with recycled greywater (waste water from inside buildings such as sink, shower and washing machine water).

This water will then be a valuable resource and used in toilet flushing, landscaping, water sculptures and in watering a unique roof-top garden.

The environment will benefit and so will resident's hip pockets with a reduction in mains water use by up to 45%.

Rain Drains

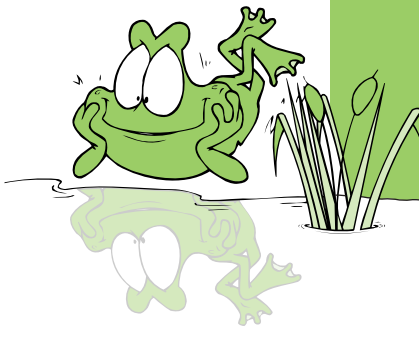
In 1997, the NSW Government first committed $60 million over three years to tackle urban stormwater pollution in response to alarming figures showing that pollution traps were catching 1000 tonnes of rubbish annually.

A vital part of the program which continues today is a community education campaign that aims to stop people putting rubbish and pollution down the drains in the first place.

It achieves this by implementing:

- A series of community service announcements screened on TV featuring prominent Australians, Don Burke and Slim Dusty.
- Outdoor advertisements in Sydney, Wollongong and Newcastle focusing on: cigarette butts; car washing; painting; and grass clippings / leaves. The advertisements show the impact on waterways.
- A mobile billboard touring central Sydney for two weeks carrying the messages.
- Training projects for industries whose products cause damage to the environment if used incorrectly by consumers (eg. paint, chemicals). The campaign shows these industries how to do the right thing.
- Community education projects like stenciling stormwater drains with the message,

  'The Drain Is Just For Rain'.



Wetland Wonder

As part of their Environmental Management Plan, the Salisbury City Council (SA) are turning stormwater into a resource and halt the flow of polluted water into the sea.

Concern is held for the health of Barker Inlet - a sensitive ecosystem and breeding ground vital to the Gulf St. Vincent. They aim to manage stormwater, while addressing the fact that many urban areas lacked visual appeal for citizens and tourists.

Stormwater, traditionally regarded as a nuisance has been collected and used in 25 wetlands constructed in urban areas.

Wetlands remove pollutants from water by filtering and settling sediment, decomposing organic matter, the sun sterilizes bacteria and plants use up nutrients.

The wetlands are now home to 150 bird species, five fish species, four frog species, yabbies and long-necked tortoises. The development includes a nature trail with boardwalks and bird hides to encourage environmental education and eco-tourism.

Outflows from wet-lands are used for irrigation and industry and the water flowing into the sea is clean. The wetlands enhance the landscape, create habitats and recover a wasted resource.

Future Farms

Throughout Hobart's Brighton district, stormwater runoff from ten urban streams and over 270 drains flow directly into the Derwent River.

A grant of $780,000 from the Commonwealth Government's Clean Seas Program has helped to redirect stormwater from entering Brighton's section of the estuary.

Brighton council has constructed a 24km pipeline network to reuse stormwater for irrigation, forestry, a golf course and farmland. This creates new enterprise and employment opportunities.

Local farmers construct storage ponds for stormwater and use it to water a range of crops including poppies. According to farmer Chris Gunn, 'If it hadn't been for this reuse scheme, we would have to sell large sections of land that the family had worked for five generations.'

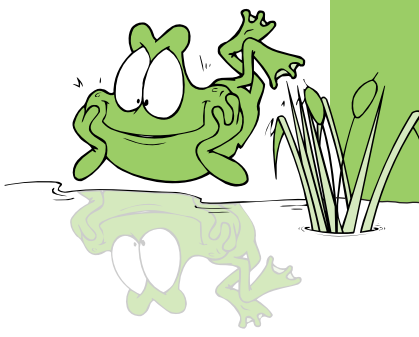
The reuse project creates a new irrigation area in Hobart, Australia's second driest capital. Between January and November 2000, approximately 50 megalitres of stormwater was diverted from the Derwent River to farms.

This successful stormwater scheme has set other Hobart councils planning what they can do to make the most of this valuable resource.

Successful Strategies - Student Worksheet

NAME:

	Penguin Parade	Rain Drains	Wetland Wonder	Future Farms
Where in Australia?				
Who is involved?				
What was the problem?				
How is the problem being addressed?				
Benefits?				
My comments: 				



The 3R's Of Education

C

FOCUS

- How can pollution problems be solved?

OBJECTIVES

- Identify what/how items can be reduced, reused, and recycled
- Understand the positive influence on stormwater

CSF II LINKS

SOSE
- 4.3 Geography
- 4.1 Economy & Society

SCIENCE
- 4.1 Chemical

HPE
- 4.2 Health of Individuals & Populations

BACKGROUND

Food waste makes up 41% and green waste 10% of household garbage. Each week Bendigo residents discard 2.9 million cigarette butts and 2 tonnes of dog droppings. In 1998, 64% of aluminium cans were recycled. It takes the same energy to make 20 recycled cans as to make 1 new can. Five sheets of office paper can be made from one milk carton.

NOTES

This activity will be most effective when carried out after the Science activity *'Waste Watching'*. Litter items collected during this activity could be saved and used as the materials for this task. The contents of the classroom or a schoolyard bin could also be used.

LEARNING TASKS

1/ Clarify the terms 'reduce', 'reuse' and 'recycle'.

2/ Relay the waste statistics in the Background (above). Discuss why waste management strategies are developed.

3/ Look over the litter items. Workshop the impacts each pollutant might have on local waterways.

4/ Discuss the many advantages of the 3R's - economical, environmental, aesthetic.

5/ Select a piece of litter and brainstorm the ways in which it could be reduced, reused and / or recycled (include composting).
- Students complete the student worksheet by choosing litter items and generating creative ways to reduce, reuse or recycle it.
- Encourage class discussion.

6/ Share ideas and highlight that one person's trash can be another's treasure and that nothing is waste unless we say it is.
- Visit **www.gould.edu.au** and explore the 'Ollie Recycles' webpage (see the English activity *'Stormwater Surfing'* for link details)

Note: The 3R's Of Education can be enhanced by:
- Playing the Extras activity *'3R's Bingo'*
- Revising Science activity *'Waste Watching'* results
- Using English activity *'The Pollution Problem'* student worksheet information

MATERIALS

- ***'The 3R's Of Education'*** **Student Worksheet** - enlarged to A3 size if necessary
- **Litter items** can be collected during the Science activity 'Waste Watching'
- **English activity *'The Pollution Problem'* Student Worksheet**
- **Extras activity *'3R's Bingo'***
- **Computers with internet**

EXTENSION

Contact the local council or log onto **www.planetark.org** to search by postcode for details of the recycling program nearest you.

ASSESSMENT

Were students able to develop pollution reduction strategies by suggesting how the 3R's relate to items? Could they make a link between these actions and stormwater quality?

The 3R's Of Education - Student Worksheet

Name:

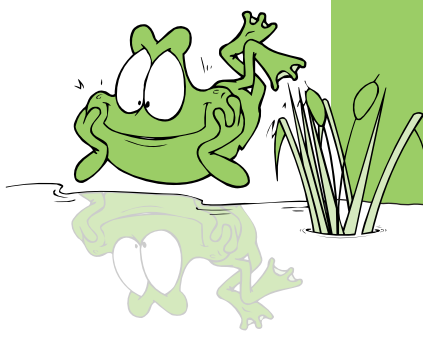
'One person's trash is another person's treasure'

Select litter items from the class pile and think of creative ways it could be reduced, reused or recycled. You'll be amazed at the difference it will make to the volume of waste produced.

Litter Item	Ways to Reduce	Ways to Reuse	Ways to Recycle
eg. Soft drink bottle	• Drink tap water • Pack a drink bottle	• Save for sauce making • Paint it as a gift vase	• Put out for council collection of recyclables

What about these items from home?

Litter Item	Reduce	Reuse	Recycle
Autumn leaves			
Unwanted clothes			
Leftover paint			
Food scraps			



Let's Do Something!

A

FOCUS

How can we reduce stormwater pollution at school?

OBJECTIVES

Analyse stormwater pollution issues in the school
Create and implement positive solutions

CSF II LINKS

SOSE
- 4.3 Geography
- 4.2 / 4.3 Economy & Society

HPE
- 4.2 Health of Individuals & Populations

BACKGROUND

Each and every household, workplace, industry and individual holds a responsibility to protect local waterways and ensure the health of plants and animals. Just as local councils are developing Stormwater Management Plans, so can your school. Your plans should indulge preventative, reactive, advocacy, and treatment measures.

NOTES

This activity is best done at the conclusion of your stormwater studies. Students will feel empowered by their ability to affect school and environmental issues and take positive steps to make a difference. The school map will be a valuable summary of the school's stormwater issues.

LEARNING TASKS

1/ Reflect on the school map and pull together all available information.

2/ As a whole class brainstorm the many ways in which positive action could be taken and list these on the board. Ideas may include:

- Place reuse and recycling bins beside all rubbish bins
- Save food scraps for chooks or begin a school vegetable garden and fertilise with school-made compost
- Establish a purchasing policy for your canteen to minimise packaging
- Establish designated and supervised eating areas to reduce litter
- Save reusable packaging and donate to the art room
- Save A4 paper used on one side only and use for scrap in classrooms
- Recycle on council collection days
- Use shredded paper as mulch
- Instigate lunchbox litter studies and hold Lunchbox Litter Free day/s
- Consider schoolyard design and increase pervious surfaces by increasing lawn and garden areas to use rainfall

3/ Students use the Worksheet to focus on one strategy and consider how it might be implemented, who will be involved, cost and effect?

4/ Put plans into action. Use the Student Representative Council, the newsletter and school assemblies to promote strategies. Get assistance from community members and businesses.

MATERIALS

- **Any worksheets from the stormwater unit that inform of the sources, types and impacts of stormwater pollution or reduction strategies.**
- ***'Let's Do Something'* Student Worksheet**

EXTENSION

Complete a playground litter survey again several months later. Have litter problems been reduced? What issues still exist? Ask a local expert to evaluate / improve your plan.

ASSESSMENT

How well were students able to integrate previous learning experiences and generate positive suggestions? Could they evaluate strategies and identify practical considerations?

Let's Do Something! - Student Worksheet

A

Name:

List some pollution reduction strategies for stormwater. Assess the strategies using PLUS, MINUS, and INTERESTING information.

P = PLUS What are the advantages, benefits, positive aspects of the strategy?

M = MINUS What are the disadvantages, drawbacks, and negative aspects?

I = INTERESTING What spinoffs, side effects might the strategy produce?

STRATEGY	PLUS	MINUS	INTERESTING
1			
2			
3			
4