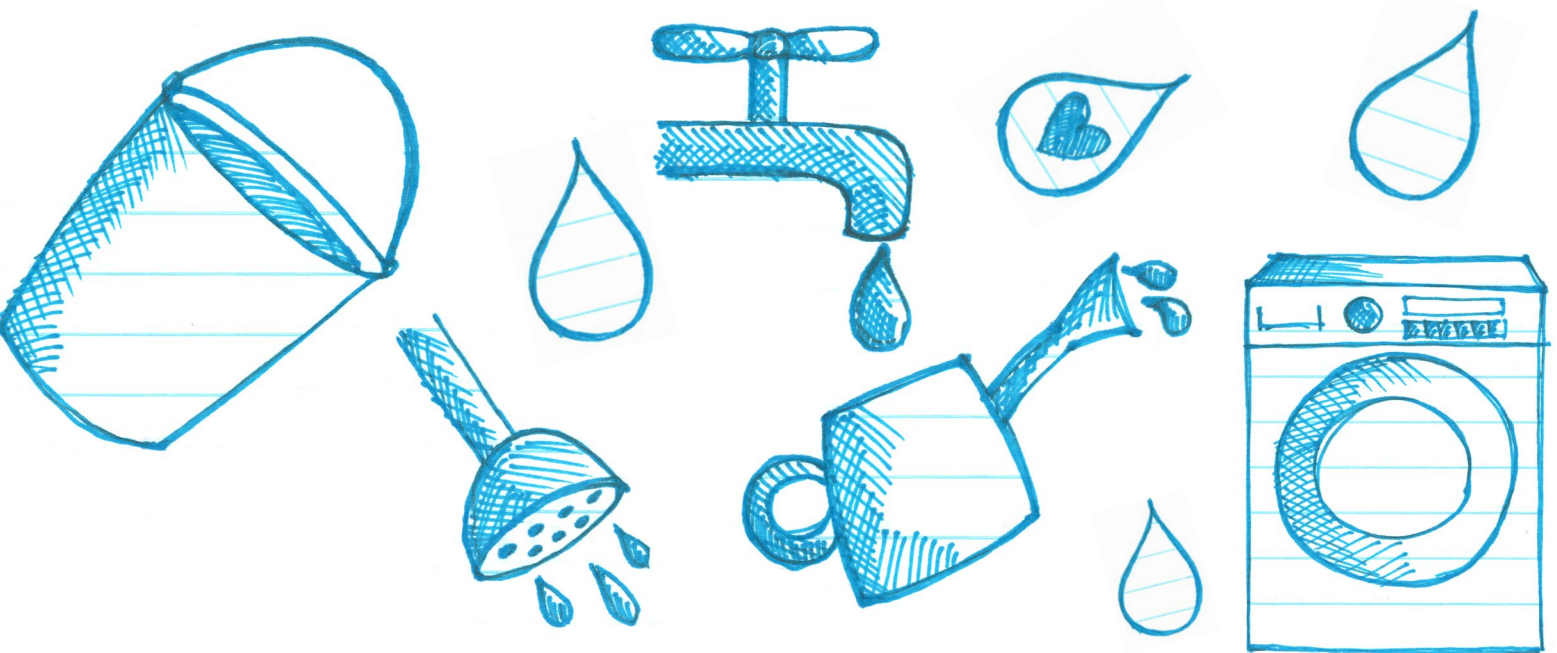




# Water Conservation

How Much River Murray Water Do You Use?

Teacher Resource Pack  
Early Years - Primary Years



# NRM Education

The NRM Education Program is playing a critical role in contributing to the knowledge, skills and confidence of young people and educators to manage natural resources sustainably.

This resource provides information and activities to assist students in learning about our most precious resource - water.

Students discover how much water is available for human use and where we get water from. Students can audit water use and develop ways to be more water wise.

For more information or to discuss opportunities for your school, contact your local NRM Education Coordinator:

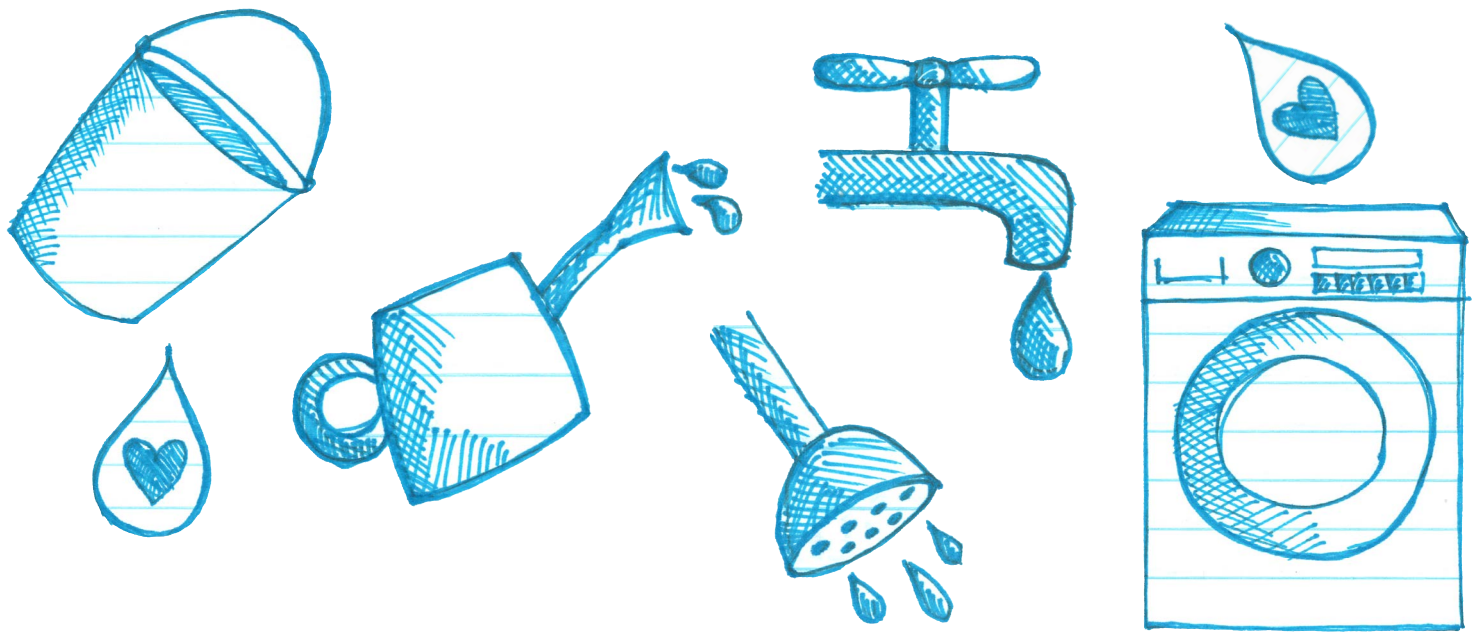
## Upper Murray

NRM Education Coordinator  
Natural Resources Centre  
2 Wade Street  
Berri SA 5343  
Phone 08 8580 1820  
Fax 08 8582 4488

## Lower Murray

NRM Education Coordinator  
Natural Resources Centre  
110A Mannum Road  
Murray Bridge SA 5253  
Phone 08 8532 9134  
Fax 08 8531 1843





# Contents

Unit Overview	Page 4
Introductory Lesson	Page 5
Water Conservation Lesson	Page 6-7
Additional Activities	Page 8-9
Water Use Chart	Page 10
Water Use Facts	Page 11
Water Use Worksheet	Page 12-13
Curriculum Links	Page 14
Resources	Page 15-16
NRM Education Contact Details	Page 17



# Unit Overview

**Year levels:** Foundation to Year 7

**Learning areas:** Science, Geography, Maths

**Big ideas:** Water is a precious resource that must be conserved. Water resources are not evenly distributed throughout the world.

**Sustainability organising ideas:**

OI.1 The biosphere is a dynamic system providing conditions that sustain life on Earth.

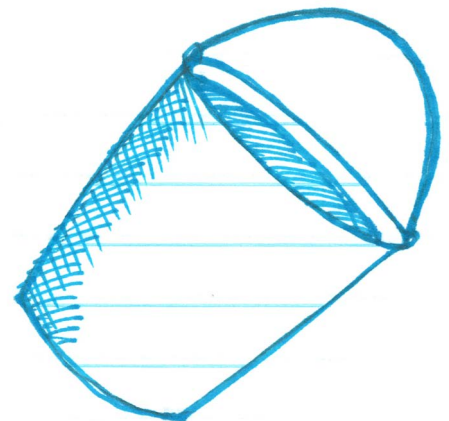
OI.7 Actions for a more sustainable future reflect values of care, respect and responsibility, and require us to explore and understand environments.

**Students will know / understand / do:**

- Understand the importance of water for people and other living things
- Know that usable fresh water makes up only a small part of all the water on Earth
- Understand how the Murray-Darling Basin provides water for people
- Identify how much water different household activities use
- Suggest ways to reduce water consumption
- Implement actions to reduce water consumption

**Essential questions:**

- Why is water important?
- Where can we find water?
- How much water is available for us to use?
- Why is the Murray-Darling Basin important?
- How can we reduce water consumption?



# Introductory Lesson

## Equipment

- World map or a local area map
- Rainfall distribution map of Australia or the world
- Clear plastic container large enough to hold 1 litre
- 2 small containers
- Measuring jug or syringe to measure 30 ml and 10 ml

## Step 1

Begin by introducing students to types of water, locations of water, availability of water.

1. Display a world map (try Wikipedia) or a local map (try the Geoscience Australia website) and ask students to identify where water is found (oceans, rivers, lakes, dams, underground, tanks, pipes, pools etc).
2. Ask students to identify the different types of water (salt water, fresh water, ice, brackish, water vapour etc).
3. Explain that enough rainwater falls everyday to cover the land in a layer 80 cm deep. That should be plenty of water for everyone. The problem is that it falls more in some areas than in others. Display a map of rainfall distribution across the world (try [www.climate-charts.com](http://www.climate-charts.com)) or Australia (try the Bureau of Meteorology website).

## Step 2

Do this activity to explain how much water is available for human use. Start with a container filled with 1 litre of water. This represents the Earth's total water.

Using that water, measure 30 ml and empty into another container. This represents the proportion that is fresh water. Take 10 ml from the second container and empty into a third. This represents the water available for us to use. The other 20 ml of fresh water is unable to be used as it is too far underground or is in icecaps etc.

## Step 3

List the places we get water from (taps, hoses, bottles, sprinklers, troughs, tanks etc). For most people in South Australia some of their water will come from the River Murray. Show students maps of the River Murray and the Murray-Darling Basin and let them pick out places they know or are interested in. The Murray-Darling Basin is Australia's largest catchment. There is a system of pumping stations, filtration plants and pipelines that carry water to communities relying on River Murray water. To find out more information check out the Murray-Darling Basin Authority website ([www.mdba.gov.au](http://www.mdba.gov.au)), particularly the 'River Murray system' page.

*Definition: A catchment is an area of land where any rain that falls will run into the lowest point, usually a river or a lake.*

Discuss if people in all countries have access to a reticulated (piped) water supply. Many have to collect it from a river, lake, well, pump or communal tap. This may involve walking long distances to collect the water and it may not be safe for drinking.



# Water Conservation Lesson

## Equipment:

- Ten 10 litre buckets
- Water Use Chart (Page 10)

## Step 1 - How much water do we use every day?

- Students individually, in groups or as a class list or draw how they use water. You may like to use the 'Water Use Worksheet' (page 12-13) for this activity - ask students to leave the 'litres' boxes empty for now.
- As a class collate the information.
- Explain to the students that each bucket holds 10 litres of water. Ask students to estimate how many buckets of water would be used to:
  - Clean your teeth with the tap running
  - Flush the toilet
  - Wash your hands
  - Have a 3 minute shower
  - Have a quarter full bath
  - Have a full bath
- Refer to the Water Use Chart and line up buckets to show how much water is used and check this against their estimates.
- Using the Water Use Chart, students can complete their Water Use Worksheets.



## Step 2 - Take action

- Ask students to suggest ways they could reduce the amount of water used to do some of these activities.
- Make a list of the suggestions.
- Ask students to pick one of the suggestions and try it at home to see if they can reduce the amount of water used to do the activity.
- Over the following days follow up with students about how their choices are going and whether any others in their home are trying to reduce their water use. Use the buckets to show the difference in their water use from the chart.

## Step 3 - Follow up discussion

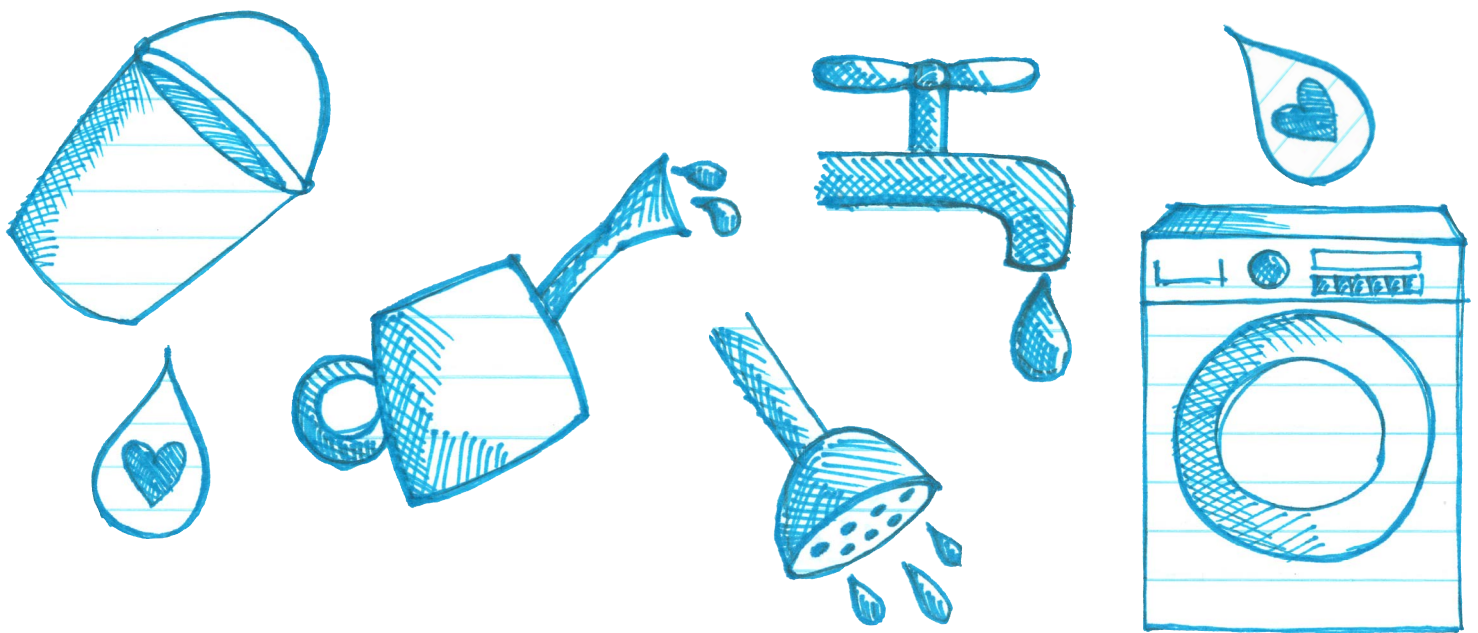
- Why is it important to reduce our water use?
- Is it just families who need to reduce their water use?
- How could this class, this school, or this town reduce their water use?
- How could we let others know how important it is to reduce water use?
- What benefits could come from reducing water use?
- What may happen if we can not reduce our water use?
- Do other countries have water restrictions? Why? Do they work?



# Water Conservation Lesson continued

## Step 4 - Take Action Activities

- Create a Big Book showing how much water is used for the activities on the Water Use Facts sheet. Include ideas from the students showing ways of reducing the amount of water needed for the activities.
- Promote your water reducing ideas to the school and community through newsletter items, posters and reminder notes.
- Hold a Save Water Day where students select a water saving action to try for the day.



# Additional Activities

## Exploring the Water Cycle

Divide the children into six small groups. Ask each group to paint one of the following pictures: sun, sea, rain, river, reservoir and a pipe leading to a tap. Ask the children to stand at the front of the group holding their paintings in a random order.

The rest of the group can then suggest the correct sequence (sun, sea, rain, river). The children with the paintings change places as suggested until the correct sequence is achieved.

Ask children to tell the water story while referring to the pictures. Prompt with questions like what happens first? What makes the water in the sea or river go up into the air? (Introduce evaporation).

What happens next? How does the water come down again? (Introduce condensation). How does the water get from the reservoir into your tap?

## Exploring Evaporation

Explore evaporation by looking at shrinking puddles and asking where the water has gone. Go outside to look at either a natural or prepared puddle. Draw around the edge in chalk. Go back again later the same day. Has it changed? How? Draw around it again. Is it smaller? Where has the water gone? Give a simple explanation of water vapour and evaporation, telling the children that the sun makes the water get warmer, dries it up, and makes it go up into the air.

OR

Leave a shallow saucer of water on a sunny windowsill or near a heater, and re-examine the next day. Discuss as above.

## Exploring Condensation

Explain that you will make the water hot and then put the water into either a saucepan or a kettle and heat it up (use appropriate safety measures). Show the children the hot water and the steam (paying appropriate attention to safety issues).

Hold a mirror over the water and show it to the children:

- What has happened to the mirror?
- What is on the mirror?
- What will it feel like?

Allow the children to touch the mirror and discover that it feels wet.

- How did the water get from the container to the mirror?

Remind the children of the steam and introduce evaporation. Explain that the mirror is colder than the steam and so makes the steam cool down and turn back in to water via condensation.

Relate these experiences to the water cycle pictures.

*Source: WaterAid*



# Additional Activities continued

## Visit your local catchment

Look for evidence of lower water levels (water marks on poles, jetties, extended beach, cracked mud etc.). Take photos of students doing activities that would not have been possible if the water level was at the usual level (playing cricket, having a picnic) or trying to do normal activities (fishing with hooks on dry land, swimming, etc.).

Measure the difference between the current water level and the normal water level. Take photos with the measurement included.

Look for locations where irrigators pump water out of the waterway or where stormwater enters.

Make a sketch of what your catchment looks like now and what it would look like if the water level was at the normal height.

## What is precious?

*NB: This activity may need to be introduced at one session, and completed at the next - a reminder letter to go home may help. In a whole class setting, it may take too long for every child to have a turn; you may therefore prefer to use it with small groups where this is possible.*

Ask children what we mean by 'precious', invite suggestions of things that are precious. Ask the children to think of something that is precious to them. Ask the children to bring the actual thing if possible, or a drawing or other representation.

Children put their precious things into a large box, to which you have added a small non-transparent container of water. Take out the objects one at a time, and invite the owner to tell everybody about their precious thing. Ask the children what it is and why it is precious to them. Last of all take out the container of water, and tell the children that this is something that could be even more precious than all the other things we have looked at. It is very precious for everyone. It is so important that we cannot live without it.



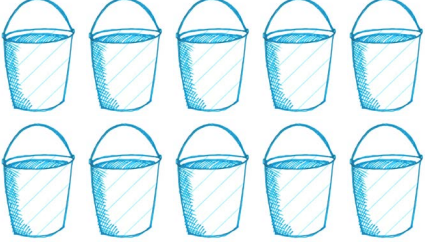


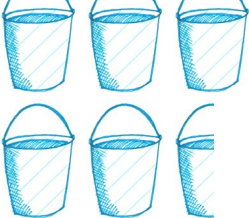


Invite suggestions about what might be inside the container, before revealing the water.

Ask why is water so precious - what do we need it for?

*Source: WaterAid*



# Water Use Chart

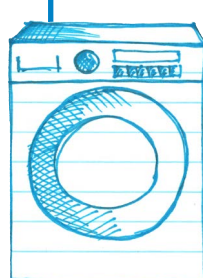
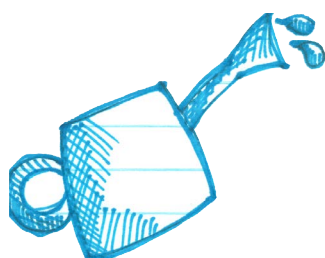
If you leave the tap running twice a day when you brush your teeth you use:	
If you wash your hands 5 times a day you use:	
If you have a 5 minute shower you use:	
If you flush the toilet 5 times a day you use:	
If you flush a DUAL FLUSH toilet 5 times a day you use:	
If you wash the dishes by hand 3 times a day you use:	
If you wash the dishes in a DISHWASHER 3 times a day you would use MORE THAN: (between 15 & 27 buckets depending on the dishwasher)	
If you have a bath you use MORE THAN: (between 5 & 15 buckets depending on the size of the bath).	

Source: MurrayCare [www.murraycare.com.au](http://www.murraycare.com.au)



# Water Use Facts

Brushing your teeth	5 litres
Washing your hands	5 litres
Flushing toilet	12 litres
Dual flush toilet	½ flush = 6 litres
Shower	20 litres per minute
Bath	50 - 150 litres
Washing machine	200 - 300 litres
Cleaning in the kitchen	8 litres
Washing dishes by hand	18 litres
Dishwasher	50 - 90 litres
Swimming pool	up to 55,000 litres
Sprinkler	1,000 litres
Washing car with hose	100 - 300 litres
Hosing the driveway	50 - 100 litres
Dripping tap	200 litres
Handheld hose	20 litres per minute



# Water Use Worksheet - page 1

## Where Do You Use Water Each Day?

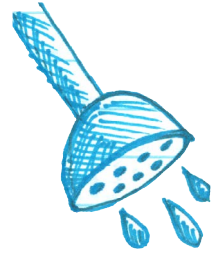
### Showering:

How many showers do you have?

How long do you shower for?  minutes

How much water do you use?

20 litres x  minutes x  number of showers =  litres



### Bath:

How full is your bath? Tick which one

☐ ¼ full    ☐ ½ full    ☐ ¾ full    ☐ Full

How much water do you use?  litres



### Cleaning Teeth:

How many times do you clean your teeth?

How long do you clean your teeth for?  minutes

Do you leave your tap running during this time? (Circle which one)

Yes/No

How much water do you use?  litres

### Toilet:

How many times do you go to the toilet?

Does your home have a dual flush toilet? (Circle which one)

Yes/No

How much water do you use?  litres

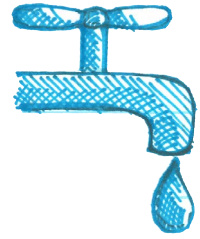


# Water Use Worksheet - page 2

## Washing Hands

How many times do you wash your hands?

How much water do you use?  litres



## Drinking water

How much water do you drink?  litres

## Other places you use water:

\_\_\_\_\_ litres used

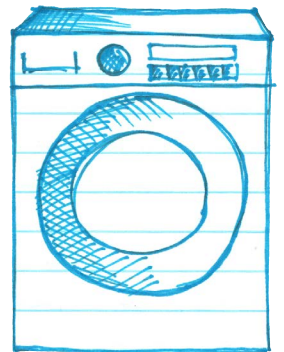
\_\_\_\_\_ litres used

\_\_\_\_\_ litres used

\_\_\_\_\_ litres used

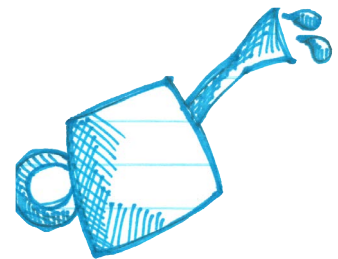
\_\_\_\_\_ litres used

\_\_\_\_\_ litres used



Total amount of water used (add up all the above amounts):

litres



What are three ways you can save water?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_



# Curriculum Links

	Year	Content Description
Science	2	Earth's resources, including water, are used in a variety of ways ( <a href="#">ACSSU032</a> )
	7	Water is an important resource that cycles through the environment ( <a href="#">ACSSU222</a> )
	<p>The Water Conservation activities also use Science as a Human Endeavour in all year levels, including Use and Influence of Science (understanding that science is used when caring for the environment and that science helps people understand the effects of their actions).</p> <p>The activities also use Science Inquiry Skills in all year levels, including Questioning and Predicting (estimating how much water is used), Planning and Conducting (carrying out water saving activities to see if they can make a difference) and Communicating (sharing their observations and results). See ACARA for details.</p>	
Geography	F	The places people live in and belong to, their familiar features and why they are important to people ( <a href="#">ACHGK002</a> )
	F	The reasons why some places are special to people, and how they can be looked after ( <a href="#">ACHGK004</a> )
	1	The natural, managed and constructed features of places, their location, how they change and how they can be cared for ( <a href="#">ACHGK005</a> )
	3	The representation of Australia as states and territories, and Australia's major natural and human features ( <a href="#">ACHGK014</a> )
	3	The main climate types of the world and the similarities and differences between the climates of different places ( <a href="#">ACHGK017</a> )
	4	The natural resources provided by the environment, and different views on how they could be used sustainably ( <a href="#">ACHGK024</a> )
	4	The importance of environments to animals and people, and different views on how they can be protected ( <a href="#">ACHGK022</a> )
	7	The classification of environmental resources and the forms that water takes as a resource ( <a href="#">ACHGK037</a> )
	7	The ways that flows of water connect places as it moves through the environment and the way this affects places ( <a href="#">ACHGK038</a> )
	7	The quantity and variability of Australia's water resources compared with those in other continents ( <a href="#">ACHGK039</a> )
	7	The nature of water scarcity and ways of overcoming it, including studies drawn from Australia and West Asia and/or North Africa ( <a href="#">ACHGK040</a> )
	7	The influence of environmental quality on the liveability of places ( <a href="#">ACHGK045</a> )
	<p>The Water Conservation activities also use Geographical Inquiry and Skills in all year levels, including Observing, questioning and planning; Collecting, recording, evaluating and representing; Communicating; and Reflecting and responding (particularly in relation to proposing individual and collective action). See ACARA for details.</p>	
Maths	1	Represent data with objects and drawings where one object or drawing represents one data value. Describe the displays ( <a href="#">ACMSP263</a> )
	2	Create displays of data using lists, table and picture graphs and interpret them ( <a href="#">ACMSP050</a> )
	3	Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies ( <a href="#">ACMSP069</a> )
	4	Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values ( <a href="#">ACMSP096</a> )
	5	Pose questions and collect categorical or numerical data by observation or survey ( <a href="#">ACMSP118</a> )

Note 1: the curriculum links listed here are the ones most closely related to the lessons, but the list is not exhaustive and there may be links to other learning areas, strands and year levels which are also fulfilled by these lesson ideas.

Note 2: curriculum links are not included for Additional Activities. Please refer to ACARA for relevant links if you undertake any of these activities.

Note 3: links can be made to other subject areas including English (Creating texts), Civics and Citizenship (Problem solving and decision making) and Health and Physical Education (Contributing to healthy and active communities). Refer to ACARA.

Note 4: For Cross-curriculum priorities and General capabilities, check the Content Descriptions at ACARA.



# Resources

## NRM Education Resources

### The River Murray Story

Students listen to a short narrative that tells the story of the River Murray as it travels from its source to the sea with the students playing the part of pollutants. Discuss solutions for preventing water pollution.

### Critters Galore

Critters Galore actively engages students in learning about aquatic macroinvertebrates, their habitats and reliance on healthy waterways. Water samples containing live specimens are brought into the classroom to familiarise students with the macroinvertebrates they are likely to find and techniques for sorting and identifying them. This session closely relates to water quality monitoring by providing an introduction to one area of biological monitoring.

### A Frog's Life

A Frog's Life is an investigation of local frogs and their features, encouraging students to become involved in monitoring the health of their waterways using frogs as an indicator.

For a copy of these resources and more visit [www.naturalresources.sa.gov.au/samurraydarlingbasin](http://www.naturalresources.sa.gov.au/samurraydarlingbasin)

## Useful Websites

The following websites contain information, resources, activities and interactive games associated with the River Murray and its issues:

**Save Water:** [www.savewater.com.au/](http://www.savewater.com.au/)

Useful and practical advice for Australians on how to save water and why.

**SA Water:** [www.sawater.com.au/SAWater/Education/LearningProgram/OnlineRes2.htm](http://www.sawater.com.au/SAWater/Education/LearningProgram/OnlineRes2.htm)

Waterwise fact sheets, student and teacher resources.

**Australian Bureau of Meteorology:** [www.bom.gov.au/lam/](http://www.bom.gov.au/lam/)

Learn about meteorology for students.

**MurrayCare:** <http://murraycare.org/>

School and teacher resources on the River Murray.

**Murray Darling Basin Authority:** [www.mdba.gov.au/](http://www.mdba.gov.au/)

Fantastic website with a Basin Kids page and lots more!

**Save the Murray:** [www.savethemurray.com.au/](http://www.savethemurray.com.au/)

Clean up and protect the River Murray and its surrounds.

**Natural Resources, SA Murray-Darling Basin:** [www.naturalresources.sa.gov.au/samurraydarlingbasin](http://www.naturalresources.sa.gov.au/samurraydarlingbasin)

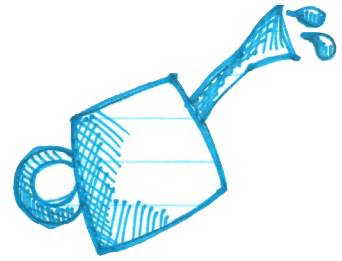
Information about managing natural resources in the SA Murray-Darling Basin region.



# Resources

## Easy fiction and picture books

- Mrs Plug the Plumber by Allan Ahlberg
- Mrs Lather's Laundry by Allan Ahlberg
- Charlie's House by Reviva Schermbrucker
- Doing the Washing by Sarah Garland
- Mrs Mopple's Washing Line by Anita Hewitt
- Five Minutes Peace by Jill Murphy
- Andrew's Bath by David McPhail
- Mrs Wishy-Washy - a Storychest book
- The King With Dirty Feet - an Indian tale - from a short story collection of that title, compiled by Mary Medicott



## Information books

- Homes - Longman Book Project
- Water in the House - Longman Book Project
- Toilets - Longman Book Project

These books should be able to be sourced from school libraries.

## School Water Audit Kit

Produced by River Murray Urban Users Committee and WaterWise South Australia

Available from libraries or online book shops.

## School camps with a River Murray theme include:

- "Camp Illawonga" at Swan Reach: [www.illawongacamp.com.au](http://www.illawongacamp.com.au)
- "Ankara" at Walkers Flat: [www.ankaracamp.org.au](http://www.ankaracamp.org.au)





## Contact Details

### Upper Murray

NRM Education Coordinator

Natural Resources Centre

2 Wade Street

Berri SA 5343

Phone 08 8580 1820

Fax 08 8582 4488

### Lower Murray

NRM Education Coordinator

Natural Resources Centre

110A Mannum Road

Murray Bridge SA 5253

Phone 08 8532 9134

Fax 08 8531 1843