

Every Drop Counts in Schools



A comprehensive teaching package
for Stage 2/3 students



Table of contents

Introduction	2
---------------------	----------

Lesson overview and pacing guide	5
---	----------

Lesson plans	15
---------------------	-----------

LESSON 1 Precious water	15
-----------------------------------	-----------

LESSON 2 Water and how we use it	19
--	-----------

LESSON 3 Managing the water supply	23
--	-----------

LESSON 4 School water audit	31
---------------------------------------	-----------

LESSON 5 Monitoring water use	47
---	-----------

LESSON 6 Saving water at school	51
---	-----------

LESSON 7 Every Drop Counts at home	61
--	-----------

LESSON 8 Spreading the word	67
---------------------------------------	-----------

Glossary	71
-----------------	-----------

Evaluation	75
-------------------	-----------

Introduction

Background

Sydney Water is the largest water utility in Australia and provides water, sewerage and limited stormwater services to approximately 4 million residential customers and 73,000 businesses in Sydney, Illawarra and the Blue Mountains.

Sydney Water has made a commitment to reduce water use per person by 35 per cent by 2011. We have programs in place to help ensure that these targets are achieved.

In January 2000, Sydney Water launched Every Drop Counts, a water conservation program designed to help customers use less water. As part of the program, Sydney Water carried out water efficiency audits at 13 schools in our area of operations.

Using the results of the audits, Sydney Water estimated a minimum of 1,500 million litres could be saved each year if all schools in the Sydney, Blue Mountains and Illawarra regions became water efficient. This amount is close to one average day's water supply for all of Sydney. Schools therefore represent a major opportunity to reduce water use.

This education resource aims to make long-term improvements in water management and water efficiency in schools. It will also increase student awareness of how precious water is and what they, and their community, can do to conserve it.

There are also many useful websites with information about water related topics, including lesson plans and other teaching resources. The following web sites are among the many sites available:

Coliban Water: www.coliban.com.au

Water activity sheets suitable for Stage 1 and 2

CSIRO Education resources: www.clw.csiro.au/education

Links relating to water topics

Melbourne Water: www.education.melbourne.com.au

Information for teachers and students

Save Water: www.savewater.com.au

Information for teachers on water conservation in Australia

Sydney Water: www.sydneywater.com.au

Water fact sheets and Every Drop Counts teaching resource

Western Australia Water Corporation: www.watercorporation.com.au

On-line activities for junior primary students



Sydney Water is committed to producing curriculum based teaching resources for schools. The Every Drop Counts program has been developed in conjunction with professional teachers to meet the needs of the current school curriculum. If you would like more information on the resources available visit www.sydneywater.com.au.

Links to the School Curriculum

The **Every Drop Counts in Schools** education resource targets Stage 2 and 3 students and takes an integrated skills approach linked to the Key Learning Areas (KLAs) of Human Society & Its Environment (HSIE), Science & Technology, English and Mathematics. The resource refers to the respective K-6 syllabuses of these KLAs.

This resource particularly addresses the requirements and format conventions of the **Environmental Education Policy for Schools**. The Policy requires schools to develop a School Environmental Management Plan (SEMP). The SEMP consists of three integral components:

- Curriculum
- Management of resources
- Management of school grounds.

All of these components are subject to audit as shown in the table below.

TABLE: Components of the SEMP for audit

FOCUS AREA	WHAT YOU CAN AUDIT
CURRICULUM	<ul style="list-style-type: none"> ● KLAs with outcomes specific to the environment. ● KLAs that do not have an environmental focus but could have environmental education topics to support achievement of their outcomes. ● Specific environmental events, days and programs.
MANAGEMENT OF RESOURCES	<ul style="list-style-type: none"> ● Electricity and energy ● Products and materials ● Water ● Waste
MANAGEMENT OF SCHOOL GROUNDS	<ul style="list-style-type: none"> ● Biodiversity ● Soil ● Noise ● Litter ● Shade ● Human traffic ● Visual amenity ● Stormwater ● Who uses the school grounds ● Buildings

Source: 'Implementing the Environmental Policy in your School', supporting document to the 'Environmental Education Policy for Schools.'

As highlighted in bold in the table, the Every Drop Counts in Schools education resource will assist your school in its preparation of the SEMP by providing a detailed water audit process involving students and teachers. The water audit could be used as a template for the other audits. The resource may also assist in the development of the other components of the SEMP shown in bold.

The resource guides students and teachers in using the water audit results to develop a water management action plan (The Every Drop Counts Action Plan) as promoted in the Environmental Education Policy. A process is outlined in the resource to develop, implement and evaluate the water management action plan. The school could endorse the action plan as part of its SEMP or all of the SEMP for a year.

As stated in the Environmental Education Policy, "teachers can incorporate the audit, design and implementation of the management plan into the formal curriculum". With this in mind the resource links the water audit and action plan processes with practical curriculum-based activities.

How to use this resource

The resource consists of eight lessons listed in the *Lesson overview and pacing guide*. Every Drop Counts in Schools links to relevant KLA outcomes, indicators and Environmental Education objectives.



Lesson overview and pacing guide

Contact your Every Drops Counts Coordinator on **1800 724 650** to arrange your two half day visits in weeks 4 and 6.

Section 1: Every Drop Counts

Lesson 1	Precious water	<i>The world's useable water</i>	Week 1 2 sessions
Lesson 2	Water and how we use it	<i>How do people use water?</i> <i>Home water consumption</i>	Week 2 2 sessions

Section 2: Measuring and monitoring water use

Lesson 3	Managing the water supply	<i>The water cycle</i> <i>The managed water supply</i> <i>Calculating and analysing water usage</i> <i>Reading the water meter</i>	Weeks 3 & 4 2 sessions
Lesson 4	School water audit	<i>Identifying where water is used</i> <i>Investigating problems & solutions</i>	Week 4 1 session + visit
Lesson 5	Monitoring water use	<i>Reading water accounts</i>	Week 5 1 session

Section 3: Every Drop Counts Action Plan

Lesson 6	Saving water at school	<i>Develop EDC School Water Action Plan</i> <i>Advertise EDC School Water Action Plan</i> <i>Conduct Action Day</i>	Weeks 6 & 7 3 sessions + visit
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Section 4: Adopting water saving behaviours

Lesson 7	Every Drop Counts at home	<i>Water meter readings</i> <i>Encouraging and evaluating water saving behaviour at home</i>	Weeks 8 & 9 2 sessions
Lesson 8	Spreading the word	<i>Communications</i> <i>Follow-up meter readings</i>	Week 9 3 sessions

16 sessions plus two half days equates to one full day excursion held at school.

Key learning areas:

Mathematics, Science & Technology, Human Society & Its Environment and English

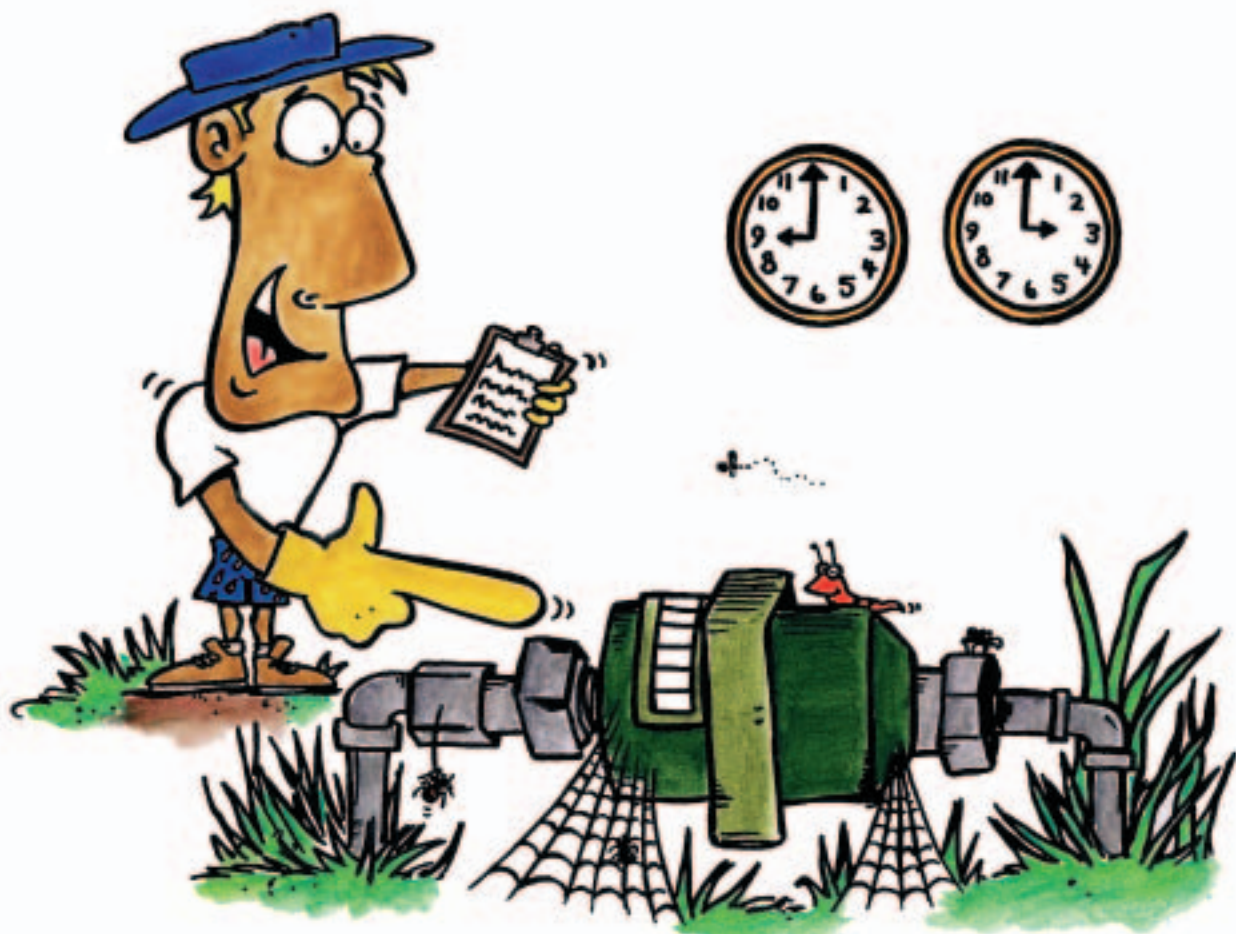
Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 1 Precious water				
<ul style="list-style-type: none"> Understand that useable water is a precious commodity. 	1. Read and discuss water facts from the World, Australia and the local perspective.	English RS 3.5 Reads independently an extensive range of texts with increasing content demands and responds to themes and issues. TS 3.2 Interacts productively and with autonomy in pairs and groups of various sizes and composition, uses effective oral presentation skills and strategies and listens attentively.	<ul style="list-style-type: none"> Reads extended novels and informational texts for personal enjoyment, interest and research. Interprets a variety of literary and factual texts. Listens in group discussions and records key issues. 	<ul style="list-style-type: none"> The impact of people on environments (K2). A respect for life on earth (V1).
<ul style="list-style-type: none"> Demonstrate the earth's useable fresh water in percentages. 	2. Represent the earth's water using an appropriate medium.	Mathematics M3.1(a) Selects from a range of units and measuring devices to measure accurately and record in practical situations.	<ul style="list-style-type: none"> Reads and interprets the scale on measuring devices. 	<ul style="list-style-type: none"> Applying technical skills within an environmental context (S1).



Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 2 Water and how we use it				
<ul style="list-style-type: none"> Identify the varied ways people use water. 	1. View, discuss, extend and present ideas based on fact sheet <i>Water and how we use it</i> .	<p>English TS3.2 Interacts productively and with autonomy in pairs and groups of various sizes and composition, uses effective oral presentation skills and strategies and listens attentively.</p> <p>HSIE ENS 3.6 Explains how various beliefs and practices influence the ways in which people interact with, change and value the environment.</p>	<ul style="list-style-type: none"> Uses a range of strategies to participate cooperatively in small group discussions e.g. adding to the group's ideas. Examines how natural and cultural factors influence people's interactions with environments e.g. the family's location, leisure, number of members. 	<ul style="list-style-type: none"> The impact of people on environments (K2).
<ul style="list-style-type: none"> Investigate daily water consumption at home. 	2. Create a method of recording family members' water consumption.	<p>Mathematics M3.1(a) Selects from a range of units and measuring devices to measure accurately and record in practical situations.</p>	<ul style="list-style-type: none"> Reads and interprets the scale on measuring devices. 	<ul style="list-style-type: none"> Applying technical skills within an environmental context (S1).



Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 3 Managing the water supply				
<ul style="list-style-type: none"> Understand how water is supplied in an urban environment. 	1. Read, interpret, discuss information about the water cycle, catchment areas and getting water from dams to taps before labelling the water cycle and managed water supply.	English WS3.9 Produces a wide range of well structured and well presented literary and factual texts for a variety of purposes and audiences using increasingly challenging topics, ideas, issues and written language features.	<ul style="list-style-type: none"> Uses technical language in an explanation. 	<ul style="list-style-type: none"> The principles of ecologically sustainable development (K4).
<ul style="list-style-type: none"> Measure water consumption for an extended period of time. 	2. Record, graph and interpret information read from a school water meter.	Mathematics M3.1(a) Selects from a range of units and measuring devices to measure accurately and record in practical situations.	<ul style="list-style-type: none"> Reads and interprets the scale on measuring devices. 	<ul style="list-style-type: none"> Applying technical skills within an environmental context (S1).



Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 4 School water audit				
<ul style="list-style-type: none"> Prepare and conduct a water audit survey to develop an awareness of water use in the school. 	1. Your Every Drop Counts Coordinator leads the class groups through the school water audit.	Science & Technology UTS3.9 Evaluates, selects and uses a range of equipment, computer based technology, materials and other resources to meet the requirements and constraints of investigation and design tasks.	<ul style="list-style-type: none"> Observes, documents, analyses and reports on water usage. 	<ul style="list-style-type: none"> Applying technical skills within an environmental context (S1).
<ul style="list-style-type: none"> Identify and communicate any problems and possible solutions for water management in the school. 	2. Present possible solutions to identified problems of water usage in the school environment for discussion.	Science & Technology INVS 3.7 Conducts their own investigations and makes judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data and drawing conclusions.	<ul style="list-style-type: none"> Presents outcomes of water usage and flow, undertakes tests, documents findings and shares conclusions. 	<ul style="list-style-type: none"> Communicating environmental problems to others (S3).
<ul style="list-style-type: none"> Produce a draft action plan. 	3. Data is collated for inclusion in a draft action plan for the school.	Science & Technology INVS 3.7 Conducts their own investigations and makes judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data and drawing conclusions.	<ul style="list-style-type: none"> Presents outcomes of water usage and flow, undertakes tests, documents findings and shares conclusions. 	<ul style="list-style-type: none"> Resolving environmental problems (S4).



Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 5 Interpreting Sydney Water accounts				
<ul style="list-style-type: none"> Interpret information through a variety of formats. 	1. Discusses information contained on Sydney Water accounts.	English RS3.6 Uses a range of skills and strategies appropriate to the type of text being read.	<ul style="list-style-type: none"> Uses several strategies for finding information in texts. 	<ul style="list-style-type: none"> Applying technical skills within an environmental context (S1).
<ul style="list-style-type: none"> Communicating information through a visual medium. 	2. Create a Neville cartoon using fact sheet <i>Interpreting Sydney Water accounts</i> .	English WS3.9 Produces a wide range of well structured and well presented literary and factual texts for a variety of purposes and audiences using increasingly challenging topics, ideas, issues and written language features.	<ul style="list-style-type: none"> Relates to audience using humour. Works with different text types using different channels of communication e.g. poetry, cartoons, dramatic performance. 	<ul style="list-style-type: none"> Communicating environmental problems to others (S3).
<ul style="list-style-type: none"> Compare trends in home water consumption patterns. 	3. Compare home water consumption using the family's Sydney Water account.	Mathematics M3.1(a) Selects from a range of units and measuring devices to measure accurately and record in practical situations.	<ul style="list-style-type: none"> Reads and interprets the scale on measuring devices. 	<ul style="list-style-type: none"> Applying technical skills within an environmental context (S1).



Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 6 Saving water at school				
<ul style="list-style-type: none"> Prepare a water saving proposal. 	1. Collating information, drawing conclusions and formatting a proposal.	English WS3.9 Produces a wide range of well structured and well presented literary and factual texts for a variety of purposes and audiences using increasingly challenging topics, ideas, issues and written language features. WS3.12 Produces texts in a fluent and legible style and uses computer technology to present these effectively in a variety of ways.	<ul style="list-style-type: none"> Uses computer software programs and associated technology to format a variety of texts. Varies font and layout to suit particular audience and purpose. Chooses appropriate graphics to accompany text. When necessary, records information from a variety of sources before writing. Plans writing through discussion with others and by making notes, list or drawing diagrams. Writes more detailed reports with increased technicality. 	<ul style="list-style-type: none"> Resolving environmental problems (S4).

(continued)



Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 6 Saving water at school (continued)				
<ul style="list-style-type: none"> Advertising the School Water Action Day. 	2. Design a media campaign.	<p>English</p> <p>RS3.5 Reads independently an extensive range of texts with increasing content demands and responds to themes and issues.</p> <p>RS3.6 Uses a comprehensive range of skills and strategies appropriate to the type of text being read.</p> <p>TS3.1 Communicates effectively for a range of purposes and with a variety of audiences to express well developed, well organised ideas dealing with more challenging topics.</p> <p>WS3.9 Produces a wide range of well structured and well presented literary and factual texts for a variety of purposes and audiences using increasingly challenging topics, ideas, issues and written language features.</p> <p>WS3.13 Critically analyses own texts in terms of how well they have been written, how effectively they present the subject matter and how they influence the reader.</p>	<ul style="list-style-type: none"> Reads informational texts for research. Interprets a variety of factual texts. Interprets more complex charts, graphs. Uses several strategies for finding information in texts e.g. skimming for gist, scanning for specific information, glossary, index. Produces a wide variety of spoken texts. Reports information with accompanying graphics. Explains to a group a complex phenomenon using technical vocabulary e.g. how to manage the water supply. Attempts to persuade others to a point of view or action, presenting reasons. Constructs text in a range of media e.g. video, multimedia, audio. Explores options for influencing readers in writing. 	<ul style="list-style-type: none"> Resolving environmental problems (S4).
<ul style="list-style-type: none"> Participation in the School Water Action Day. 	3. The School Water Action Day.	<p>Science & Technology</p> <p>INVS 3.7 Conducts their own investigations and makes judgements based on the results of observing, questioning, planning, predicting, testing, collecting, recording and analysing data and drawing conclusions.</p>	<ul style="list-style-type: none"> Predicts outcomes of water usage and flow, undertakes tests, documents findings and shares conclusions. 	<ul style="list-style-type: none"> Adopting behaviours and practices that protect the environment (S5).

Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 7 Every Drop Counts at home				
<ul style="list-style-type: none"> Gather and communicate water saving information to others. 	1. Record home water meter readings. Discuss ideas for saving water at home.	<p>HSIE ENS3.5 Demonstrates an understanding of the interconnections between Australia and global environments and how individuals and groups can act in an ecologically responsible manner.</p> <p>English RS3.6 Uses a range of skills and strategies appropriate to the type of text being read.</p> <p>WS3.9 Produces a wide range of well structured and well presented literary and factual texts for a wide variety of purposes and audiences, using increasingly challenging topics, ideas, issues and written features.</p>	<ul style="list-style-type: none"> Explains the effects of human changes on an environment, evaluating the positive and negative aspects of these changes. Uses several strategies for finding information products accessible to a wider audience. Creates information products accessible to a wider audience. 	<ul style="list-style-type: none"> Resolving environmental problems (S4).
<ul style="list-style-type: none"> Implementing water saving actions. 	2. Adopt and evaluate new water saving practices at home.	<p>HSIE ENS3.6 Explains how various beliefs and practices influence the ways in which people interact with, change and value the environment.</p>	<ul style="list-style-type: none"> Examines how natural and cultural factors influence people's interaction with environments e.g. the family's location, leisure, number of members. 	<ul style="list-style-type: none"> The principles of ecologically sustainable development (K4).



Focus	Activity	KLA Outcomes	Indicators	Environmental Education Objectives
Lesson 8 Spreading the word				
<ul style="list-style-type: none"> Inform others of water saving actions. 	1. Inform younger students and the wider community through a variety of student generated activities.	<p>HSIE ENS3.5 Demonstrates an understanding of the interconnections between Australia and global environments and how individuals and groups can act in an ecologically responsible manner.</p> <p>English TS3.1 Communicates effectively for a range of purposes and with a variety of audiences to express well developed, well organised ideas dealing with more challenging topics.</p>	<ul style="list-style-type: none"> Imparts information to others. Explains the effects of natural changes on the environment, such as floods, earthquakes, drought and how people respond to these changes. Participates in the maintenance or improvement of an environment e.g. supports bush regeneration, water management. Evaluates a variety of ways of addressing environmental problems in Australia. 	<ul style="list-style-type: none"> The principles of ecologically sustainable development (K4).
<ul style="list-style-type: none"> Conduct follow-up water audit and prepare draft SEMP for water. 	2. Conduct follow-up water audit and prepare a draft summary for the SEMP.	<p>English RS3.6 Uses a range of skills and strategies appropriate to the type of text being read.</p> <p>WS3.12 Produces texts in a fluent and legible style and uses computer technology to present these effectively in a variety of ways.</p>	<ul style="list-style-type: none"> Uses several strategies for finding information in texts. Varies font and layout to suit particular audience and purpose. Uses word processing programs to design reports, importing graphics or table and written texts from a range of sources. 	<ul style="list-style-type: none"> Evaluating the success of their actions (S3). Resolving environmental problems (S4).

Lesson 1

Precious water



Activities

1. The class reads and discusses *Fact sheet - Precious water*.
2. To develop the concepts introduced in *Fact sheet - Precious water* choose one of the following:

Fish tank

- Fill a fish tank or bowl to represent all water on earth.
- Estimate and indicate the following percentages - 97 per cent salt water, 2 per cent frozen fresh water, 0.5 per cent useable fresh water and 0.5 per cent unusable fresh water.
- Empty the tank leaving only the percentage that represents useable fresh water. (Remember to dispose of the water appropriately e.g. in a garden.)

Jelly or playdough

- Estimate and indicate the water percentages using different coloured jellies or playdough.

Mural

- Divide a large sheet of butchers paper into four layers.
- Paint layers to depict the various percentages.
- Label for display, this can be used as a backdrop for classroom display.

Homework activity

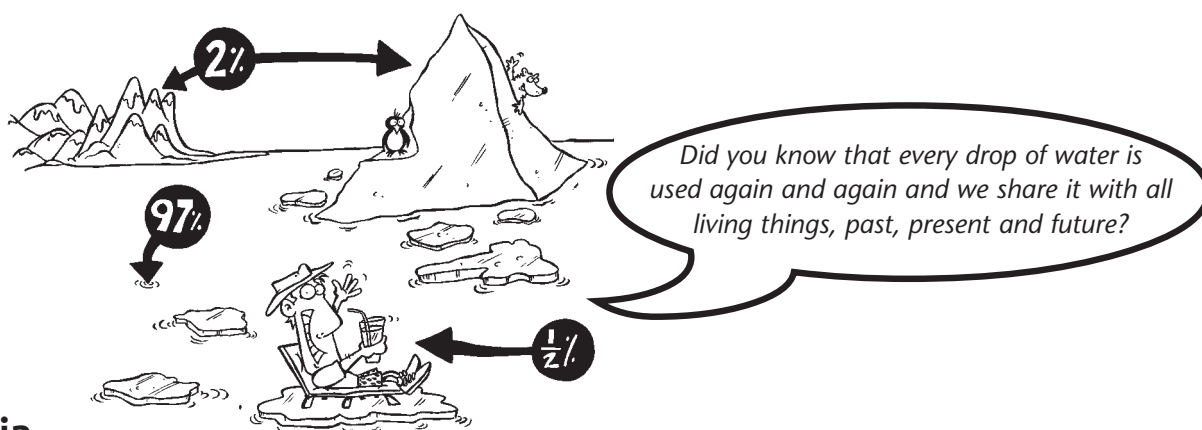
- The students fill in *Worksheet - Precious water*.



Precious water

The World

- Three quarters of the Earth's surface is covered with water.
- 97 per cent of this water can't be used by people, plants or animals, because it is found in the oceans as salt water.
- The other 3 per cent is fresh water. Of this 2 per cent is frozen in ice caps, glaciers and on snowy mountain ranges.
- Only about 0.5 per cent of the remaining water on earth is useable, fresh water.
- 80 per cent of the water we use is surface water.
- 30 to 50 times more water is found underground. Ground water is the water found between particles of soil and rocks beneath the ground.



Australia

- In the last 100 years there have been 37 years of major drought conditions in NSW.
- Different States and Territories use different amounts of water, the hottest states use the most water.

Sydney

- The water we use inside our homes each day in the Sydney catchment area would fill 450 Olympic swimming pools.
- The water we use outside our homes each day in the Sydney catchment area would fill 150 Olympic swimming pools.

People

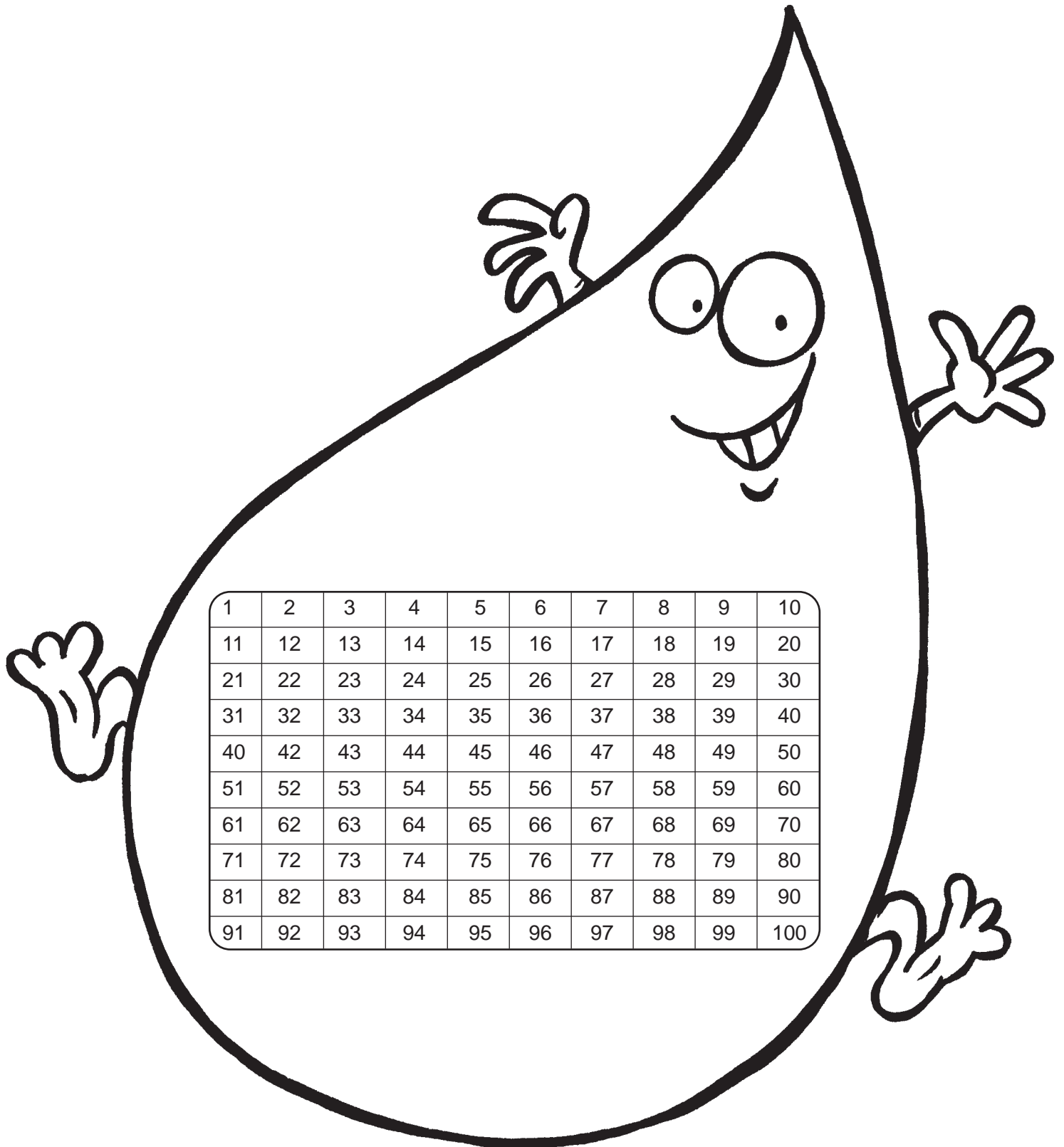
- Water makes up two-thirds of your body.
- People drink six to eight cups of water, milk, fruit juice, soft drink, tea or coffee a day.
- Plants and animals are mostly water too.
- People use water for drinking, cleaning, growing and processing food, growing crops, leisure activities, cooking, putting out fires and generating electricity.
- The average daily water use per Australian is about 500 litres.
- 20 per cent of the water used in the home is for showering/bathing.
- 25 per cent of water is used outdoors when watering gardens.
- 23 per cent is used when flushing the toilet.



Precious water

Use the percentages from the world section on *Fact sheet 1 - Precious water*

Hint: Start at the bottom of the chart and use different coloured pencils for each percentage.



Lesson 2

Water and how we use it



Activities

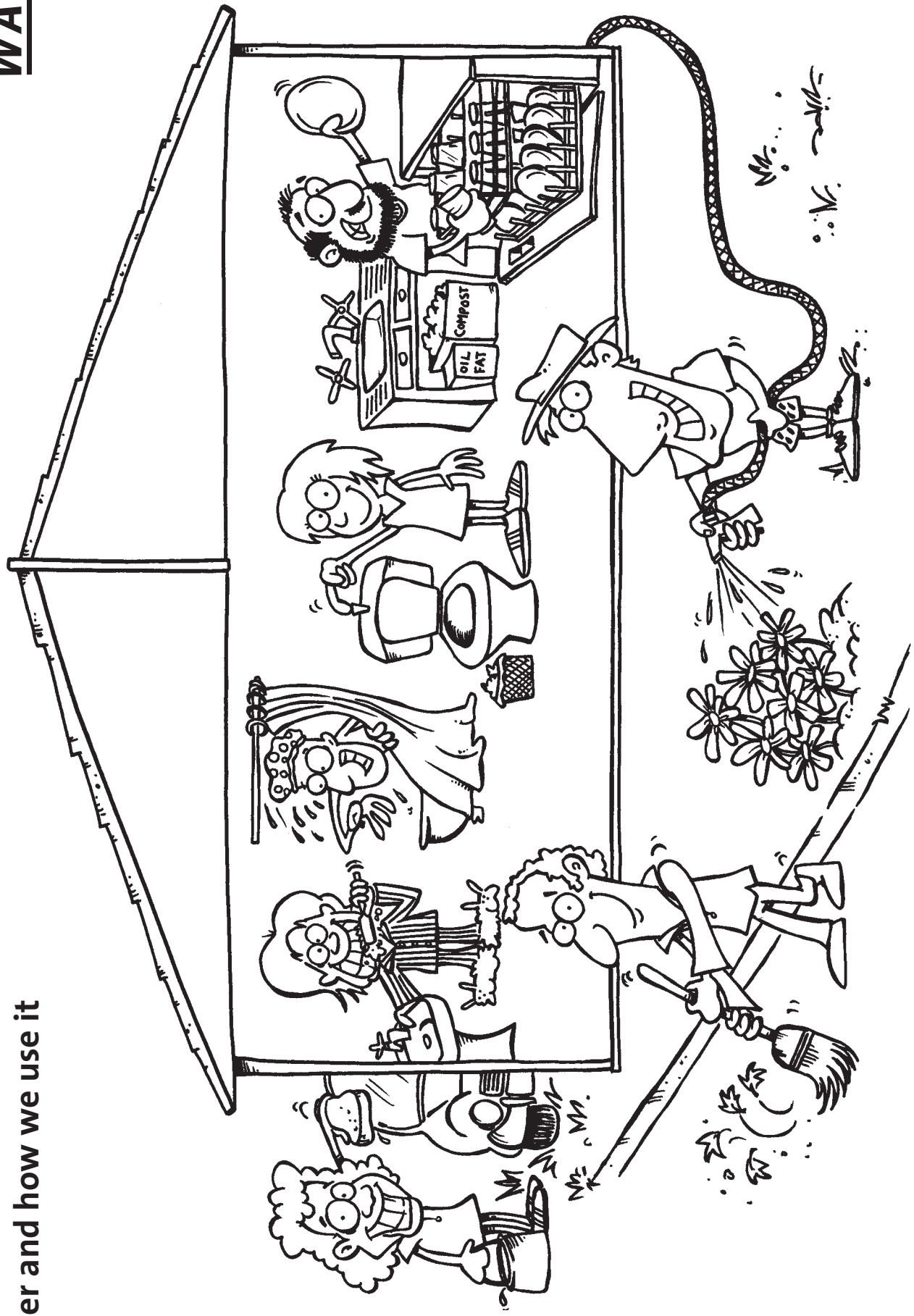
1. Using an overhead transparency or hard copy the class discusses the ways people use water at home as shown on *Fact sheet - Water and how we use it*.
 - In small groups the students discuss and record for display what would happen if they did not have water for these activities.
 - The students present their work to the class.
2. (NB) Homework must be completed before doing this activity.
Using the information from *Worksheet - Water at home*, students, as a class, complete *Worksheet - Calculating water use*.

Homework








- The students estimate their daily use of water at home and complete *Worksheet – Water at home*.



Water and how we use it



Water at home

	WATER USE	WATER QUANTITY	HOW MANY TIMES A DAY	HOW MANY TIMES A WEEK	WORKING COLUMN	TOTAL LITRES A DAY
	FLUSHING TOILET Full flush Half flush	11L 5L	e.g. 20		11 x 20	220
	SHOWERING	100L				
	HAVING A BATH Half full Full	60L 120L	e.g. 1		1 x 120 = 120	120
	CLEANING TEETH Tap running Tap turned off	5L 1L				
	WASHING HANDS	4L				
	WASHING DISHES Kitchen sink Dishwasher	15L 30L				
	COOKING A MEAL	10L				
	DRINKING A GLASS OF WATER	0.25L				
	WASHING CAR/S	180L		e.g. 1	180 x 1 = 180 180 ÷ 7 = 25.71	25.71
	WASHING PET/S	50L				
	HAND WATERING THE GARDEN OR GARDEN SPRINKLERS	400L				
Daily total (A)						

Calculating how we use water at home

	÷		=	
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Your family's total each day ÷ Number of people in your house = Your daily water consumption

Estimate the daily usage for your class

From *Worksheet - Water at home*, record then add each class member's daily home water usage

1 x  = 1 LITRE

60 x  = 

25,000 x  = 

1 x  = 1.5 MEGALITRES

	+	+
		TOTAL

	÷		=	
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Your daily class total ÷ Number of people in your class = Average daily water use for each class member

	x	4,000,000	=	
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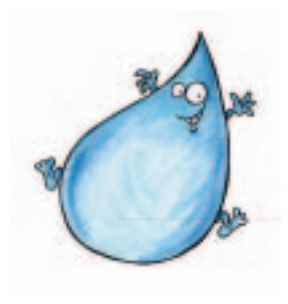
Your class average x Number of people in Sydney = Estimated daily water use for Sydney

	÷	1,000,000	=	
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Estimated total water use for Sydney ÷ Number of litres in a megalitre = Sydney's daily consumption in megalitres

Lesson 3

Managing the water supply



Activities

1. The students read *Fact sheets – The water cycle* and *Managing the water supply* and discuss with a friend. As a joint text construction, they complete *Worksheets – The water cycle* and *Sydney Water's managed water supply*.
2. The class locate, identify and record information about the school's water meter/s on *Worksheet – How to read the water meter*.
3. The teacher selects one of the following groupings to complete *Worksheet – Our schools water use*
 - the whole class
 - an expert team
 - small groups. Allocate each team to a week and two team members within the group to record information daily.

This activity takes two weeks to complete and must be completed before doing activity 4.

4. In their groups, the students graph the results of their meter readings including weekends. For comparison choose from one of the following graphing suggestions – column, pie, bar or line graph. If a database is established to record the daily water consumption readings, computer generated graphs could be easily produced for display.

The students fax the water meter readings to the Every Drop Counts Coordinator on 02 9350 5587 for future reference.

Homework

- Discuss with the students water use activities and situations such as:
 - cleaning
 - irrigation
 - leaking pipes
 - taps left on
 - water use before school e.g. bubblers, toilet and hand washing
 - before and after care school uses.

The students answer the following focus questions – Was there any water use overnight? If so what are the possible explanations?



How does the water cycle work?

Water comes from the sky as rain, hail or snow. This is called **precipitation**.

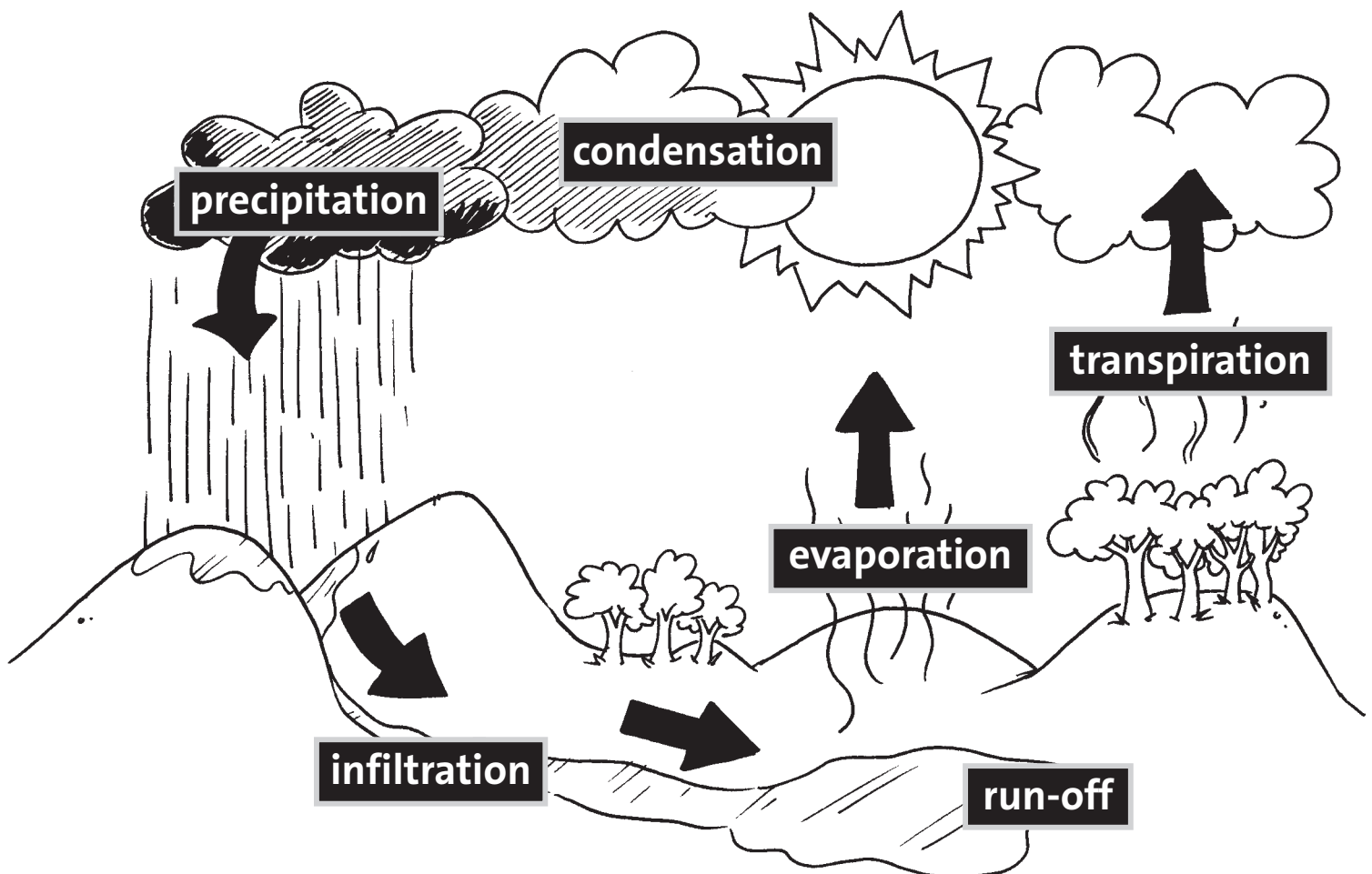
When water falls on the ground it can soak into the ground. This is called **infiltration**. The water that does not soak in is called **run-off**. This water flows into creeks, rivers or oceans.

Some water can turn to vapour. In its gaseous state water can rise invisibly into the air. This part of the cycle is called **evaporation**.

Condensation occurs when the invisible water gas turns back into a liquid in the sky. When this falls as **precipitation** the cycle starts all over again.

Water can also be released into the air by plants in a process known as **transpiration**. A way of demonstrating transpiration is to tie a clear plastic bag tightly around some leaves on a shrub and watch the water appear.

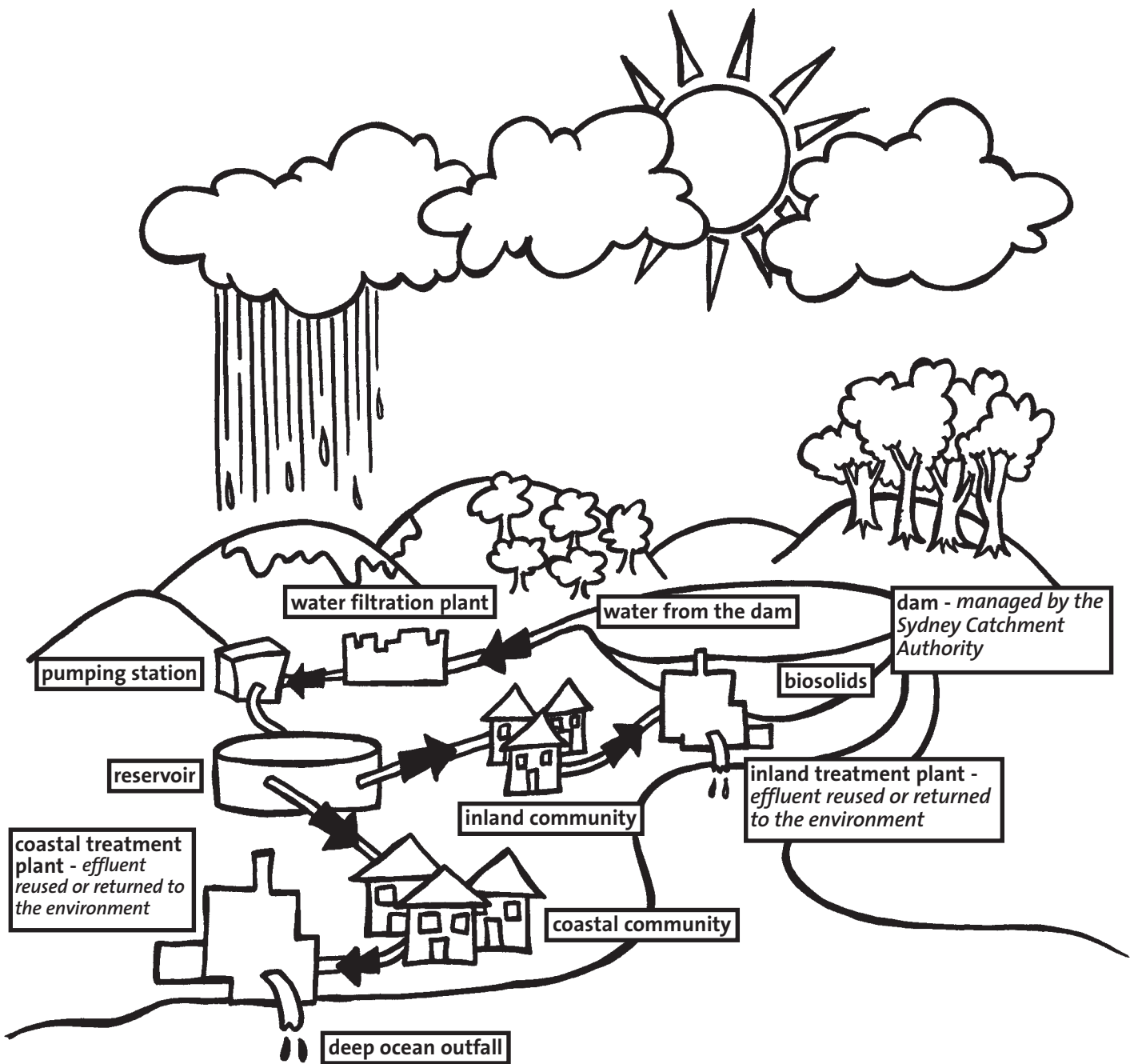
The entire process is called the **water cycle** because water goes round and round in a cycle.



Managing the water supply

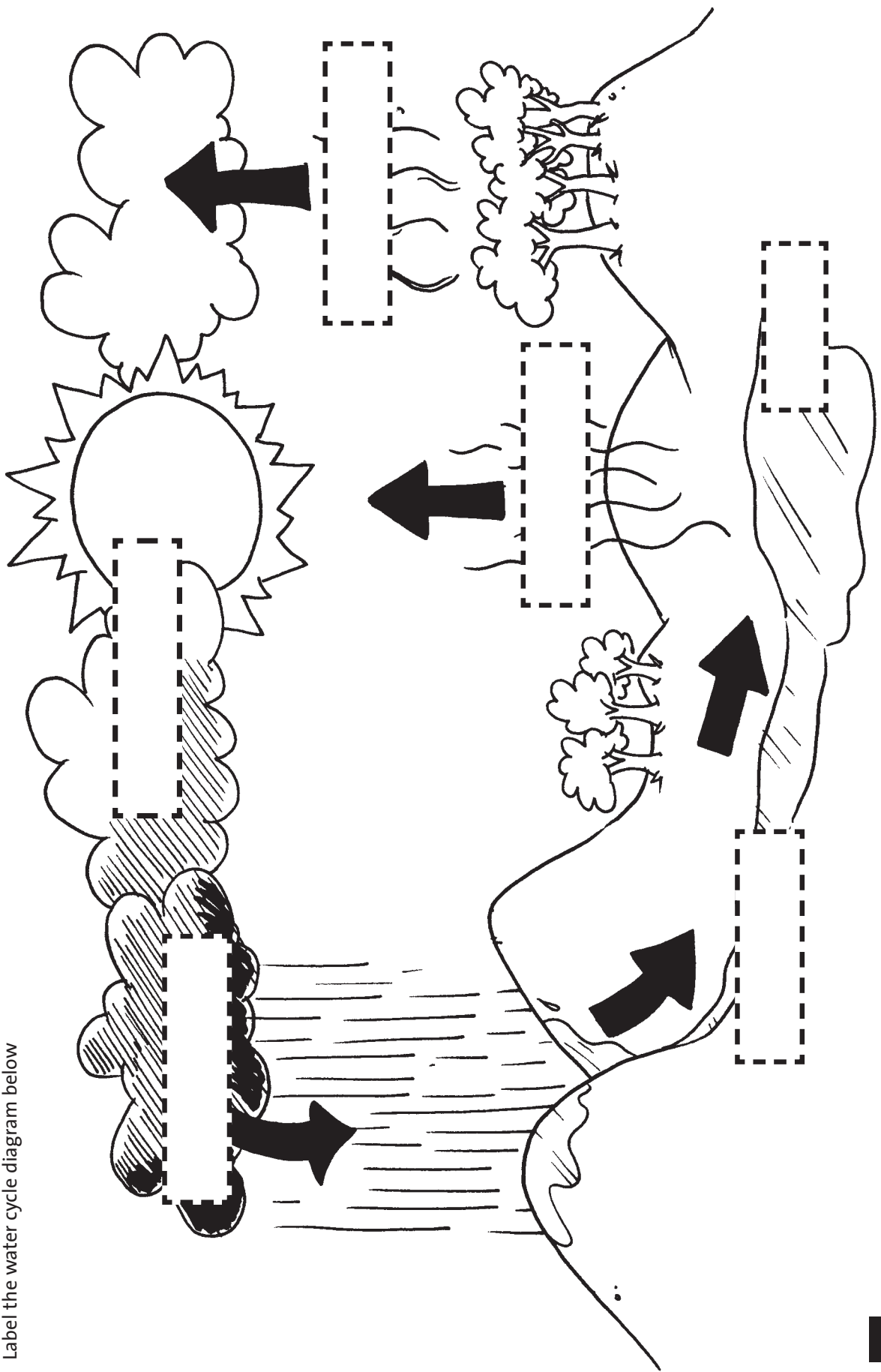
People in many parts of the world have to gather and store their own water. Most people in Australia have a water authority to manage the water cycle. This allows us to turn on the tap for clean, healthy water whenever we need it. Sydney Water is the water authority for Sydney, Illawarra and the Blue Mountains.

Water from infiltration and run-off is collected in catchment areas. Catchment areas are the lowest point in an area. Water falling anywhere on the ground ends up in the natural catchment area.



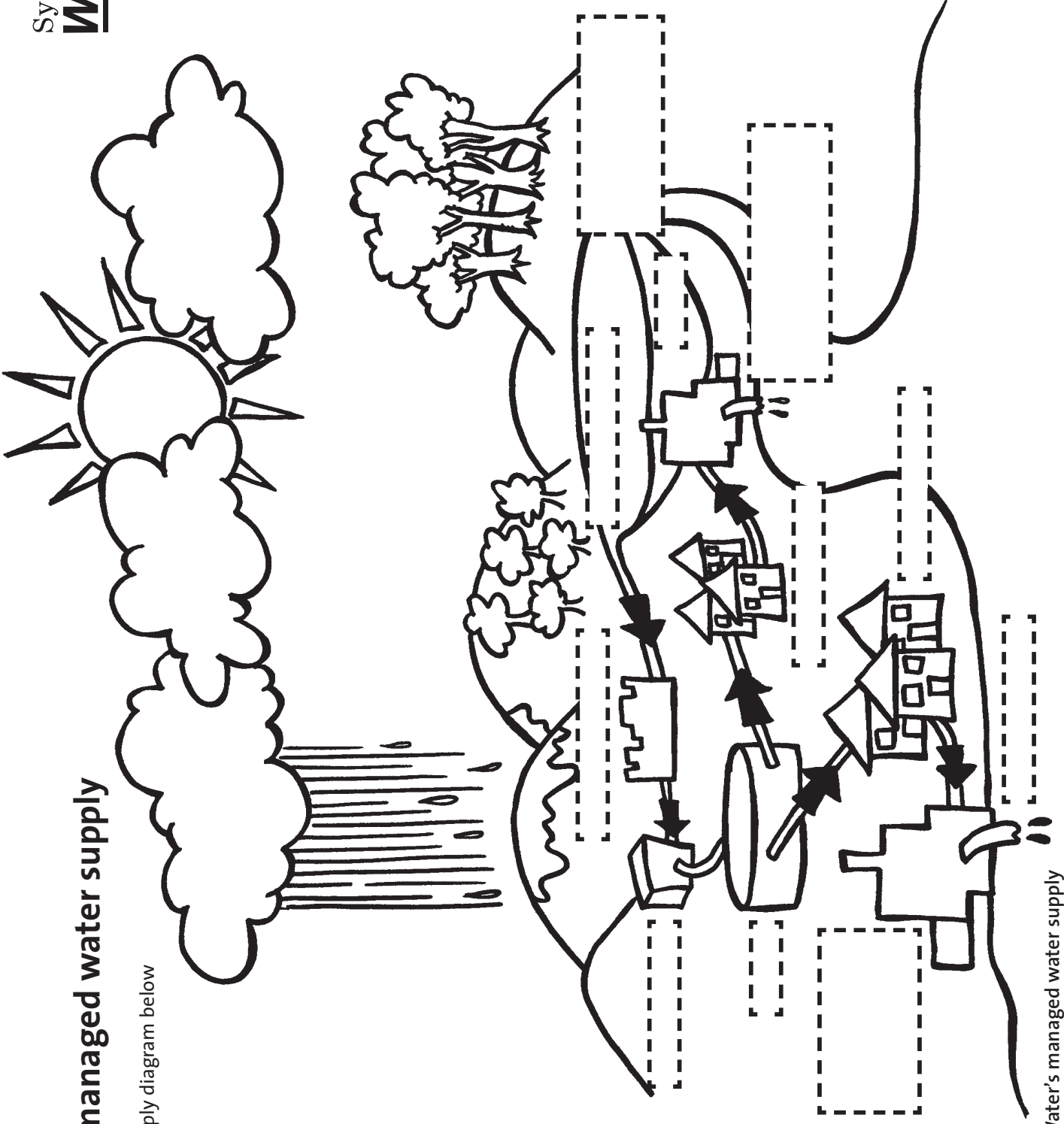
The water cycle

Label the water cycle diagram below



Sydney Water's managed water supply

Label the managed water supply diagram below

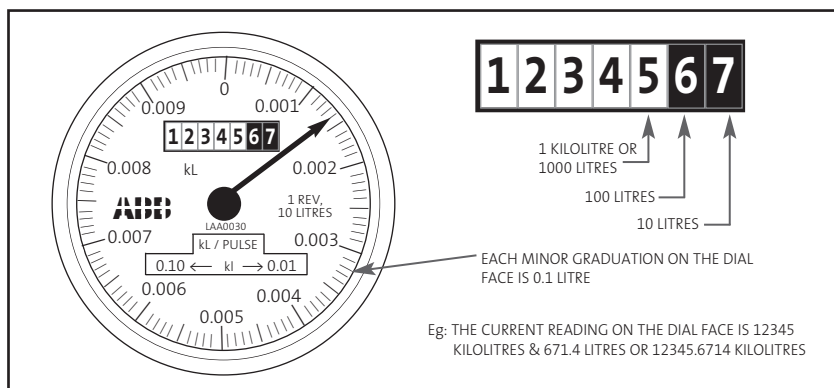


How to read a water meter

The first thing you will need to do is locate your school water meter/s. Your water meter will look something like the picture below:



On the face of the meter you will see a series of numbers. The numbers measure the amount of water used in kilolitres and litres. On most water meters the numbers in black measure kilolitres (thousands of litres) and the red numbers measure fractions of a kilolitre. The diagram below gives an example of how to read a meter.



Location of your school water meter/s

Type of meter/s

6 digit

7 digit

8 digit

Record in the blank spaces below the numbers displayed on the school's meter/s. Use a black pen for the kilolitres (1000s of litres) and a red pen for the litres (fractions of kilolitres).

○ ○ ○ ○ ○ ○ ○ ○

SIX DIGIT METER

○ ○ ○ ○ ○ ○ ○ ○ ○ ○

SEVEN DIGIT METER

○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

EIGHT DIGIT METER

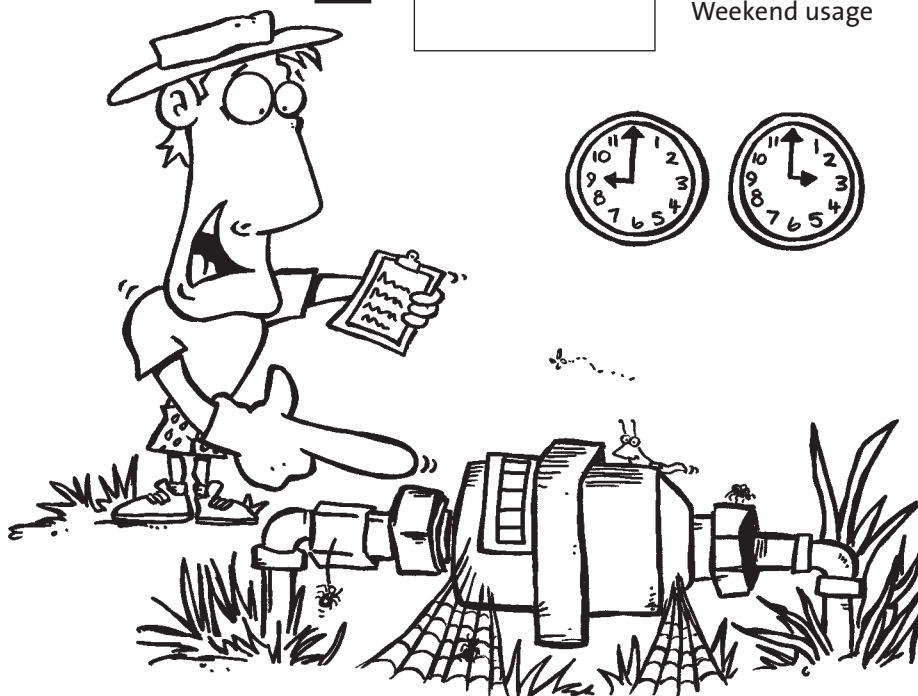
Our school's water use

Use the school water meter/s to measure the amount of water used over two consecutive weeks.

Week 1	Monday	Tuesday	Wednesday	Thursday	Friday
2nd reading (school finish)					
1st reading (school start)					
Daily usage (2nd reading – 1st reading)					
					TOTAL

Weekend usage

		Monday morning reading from week 2
—		School week total
=		Weekend usage



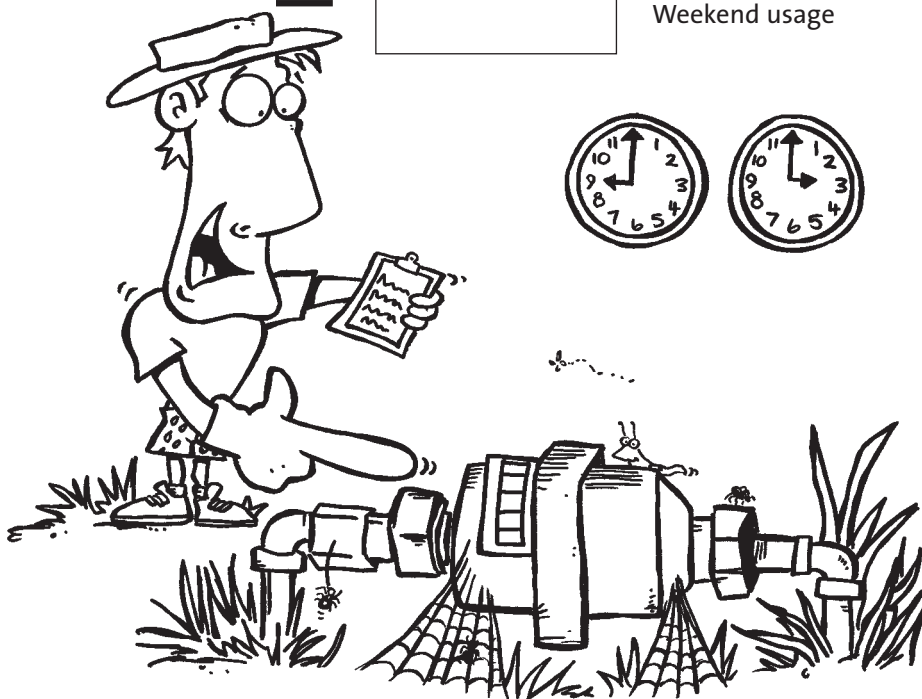
IMPORTANT: Was there any water use at night? (This means that your school finish reading would be different to your school start reading for the next day). Could this water be explained by cleaning or irrigation? If not this could mean that taps have been left on overnight or the school has leaky pipes.

Our school's water use

Week 2	Monday	Tuesday	Wednesday	Thursday	Friday
2nd reading (school finish)					
1st reading (school start)					
Daily usage (2nd reading — 1st reading)					
					TOTAL

Weekend usage

		Monday morning reading from week 3
—		School week total
—————		
=		Weekend usage



IMPORTANT: Was there any water use at night? (This means that your school finish reading would be different to your school start reading for the next day). Could this water be explained by cleaning or irrigation? If not this could mean that taps have been left on overnight or the school has leaky pipes.

Lesson 4

School water audit



Activities

Prior to commencing the water audit students should be advised of health and safety rules e.g. not to run in wet areas, hygiene around toilets etc and supplied with disposable gloves.

1. Your Every Drop Counts Coordinator visits the class and runs the water audit with assistance from the class teacher/Environmental Education teacher.
 - Divide the class into six or seven groups and allocate each group one of the following audit areas:
 - boys toilets
 - girls toilets
 - staffroom, staff toilets, offices
 - classroom taps including library
 - bubblers and disabled/accessible toilets
 - other rooms and buildings such as the canteen, hall, gym and store rooms
 - outdoor taps, irrigation and cleaning.
 - The class break into their audit groups and nominate a recorder and spokesperson for their group.
 - As problems and solutions are identified they are recorded on *Worksheet – School water audit*.
2. When groups finish their audit and return to the classroom each spokesperson then presents the possible solutions to the class for discussion. As a class, students form their draft action plan by collating all the problems/solutions tables into a single class list.



School water audit - boys toilets

Toilets

Number of toilets _____

Type of toilet single flush (push button or pull chain) dual flush

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Urinals

Number of urinals _____

Type of urinal pull chain motion sensor continuous flush and fill

Estimated volume of urinal cistern _____

Number of leaking/running urinals _____

Handbasins

Number of taps _____

Type of taps twist spring loaded lever

What is the average tap flowrate _____

Number of leaking/dripping taps _____

Number of other taps/cleaner's taps _____ hose tap vandal proof

Problems and solutions

Problem	Solution	Who is responsible for fixing?

School water audit - girls toilets

Toilets

Number of toilets _____

Type of toilet single flush (push button or pull chain) dual flush

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Handbasins

Number of taps _____

Type of taps twist spring loaded lever

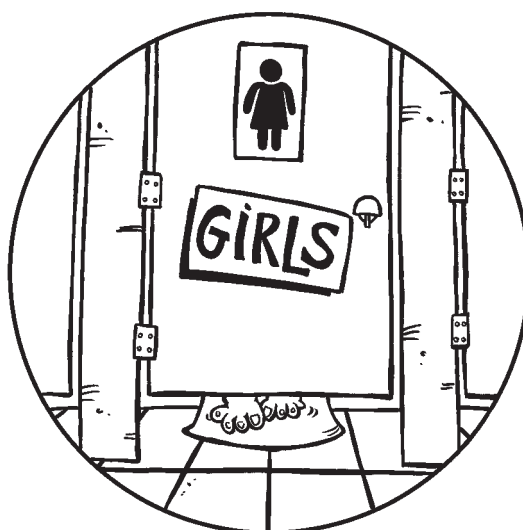
What is the average tap flowrate _____

Number of leaking/dripping taps _____

Number of other taps/cleaner's taps _____ hose tap vandal proof

Problems and solutions

Problem	Solution	Who is responsible for fixing?



School water audit - staffroom, toilets, offices

Toilets

Number of toilets _____

Type of toilet single flush (push button or pull chain) dual flush

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Urinals

Number of urinals _____

Type of urinal pull chain motion sensor continuous flush and fill

Estimated volume of urinal cistern _____

Number of leaking/running urinals _____

Handbasins (including staffroom)

Number of taps _____

What is the average tap flowrate _____

Number of leaking/dripping taps _____

Showers

Number of showers _____

Number of leaks _____



Problems and solutions

Problem	Solution	Who is responsible for fixing?

School water audit - classroom and library

Toilets

Number of toilets _____

Type of toilet single flush (push button or pull chain) dual flush

Estimated volume of toilet cistern _____

Number of leaking/running toilets _____

Handbasins

Number of taps _____

Type of taps twist spring loaded lever

What is the average tap flowrate _____

Number of leaking/dripping taps _____

Problems and solutions

Problem	Solution	Who is responsible for fixing?



School water audit - other rooms and buildings such as the canteen, hall, gym, store rooms

Toilets

Location _____

Number of toilets _____

Type of toilets single flush (push button or pull chain) dual flush

Number of leaking/running toilets _____

Urinals

Location _____

Number of urinals _____

Type of urinal pull chain motion sensor continuous flush and fill

Number of leaking/running urinals _____

Handbasins (including staffroom)

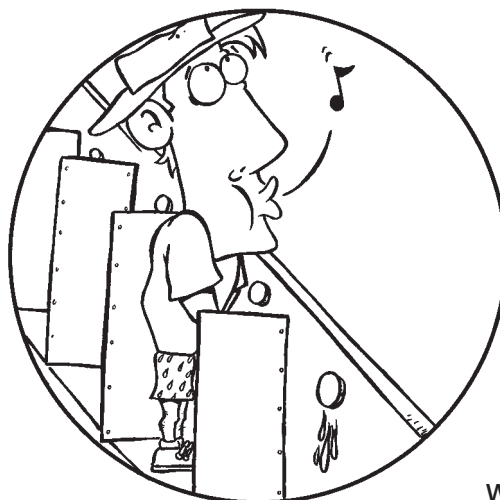
Location _____

Number of taps _____

Type of taps twist spring loaded lever

Number of leaking/dripping taps _____

(continued)



(continued)

School water audit - other rooms and buildings such as the canteen, hall, gym, store rooms

Showers

Location _____

Number of showers _____

Type of taps

twist

spring loaded

lever

Number of leaks _____

Store rooms

Location _____

Number of taps _____

Type of taps

twist

spring loaded

lever

Number of leaking/dripping taps _____

Problems and solutions

Problem	Solution	Who is responsible for fixing?



School water audit - outdoor taps, irrigation and cleaning

Outdoor taps

- Number of outdoor taps _____
- Type of taps twist spring loaded lever
- What is the average tap flowrate _____
- Number of leaking/dripping taps _____
- Are any taps vandalised or damaged? yes no
- Are any taps vandal proof? yes no

Outdoor irrigation

- Are the majority of plants native or exotic? native exotic
- How are the gardens watered? hose portable sprinkler
automatic sprinkler system
- What part of the grounds are watered regularly? _____
- How often are they watered? _____
- What time of the day are they watered? _____

Cleaning

- How often are the toilets cleaned? _____
- How many times a week are the amenities blocks hosed out? _____

Problems and solutions

Problem	Solution	Who is responsible for fixing?

School Water Audit - Summary

Toilets	Number	Leaking, running or broken
Girls		
Boys		
Urinal - boys		
Urinal - staff		
Disability		
Other		
Total		



Taps: Hand basins and sinks	Number	Leaking, running or broken
Girls		
Boys		
Staffroom and offices		
Disability toilet		
Classrooms		
Canteen		
Other		
Total		



Taps: cleaning and grounds	Number	Leaking, running or broken
Girls toilet		
Boys toilet		
Staff toilet		
Disability toilet		
Canteen		
Grounds		
Other		
Total		



(continued)

(continued)

School Water Audit - Summary

Showers	Number	Leaking, running or broken
Girls		
Boys		
Staff		
Disability		
Other		
Total		



Bubblers	Number	Leaking, running or broken
Girls toilet		
Boys toilet		
Staff toilet		
Disability toilet		
Playground		
Other		
Total		



Other	Number	Leaking, running or broken
Dishwasher		
Hot water urn		
Water cooler		
Rainwater tank		
Sprinkler system		
Drip watering system		
Other		
Total		



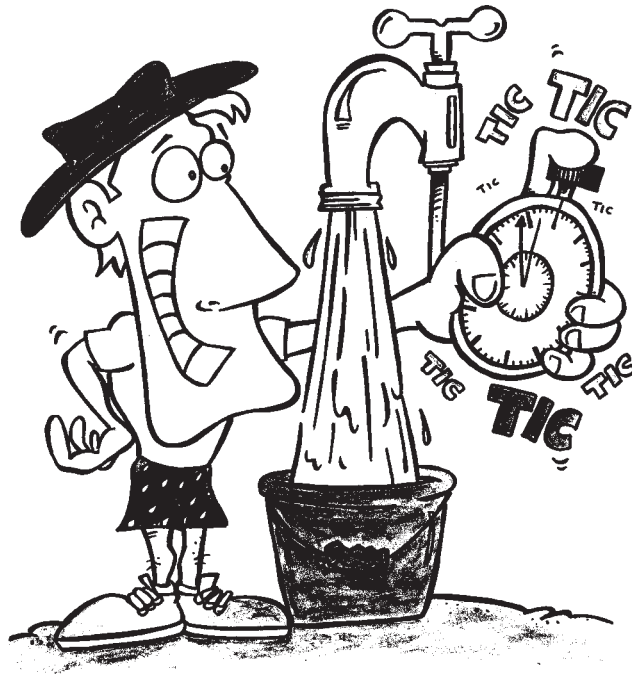
Where water is wasted at our school

Possible problems	Possible actions

Great water saving actions at our school

Where	Water saving actions
Classrooms	
Toilets/showers	
Bubblers	
Other buildings — canteen, library, hall, gym	
Outdoors — garden and grass	
Outdoors — playground	

School water audit areas



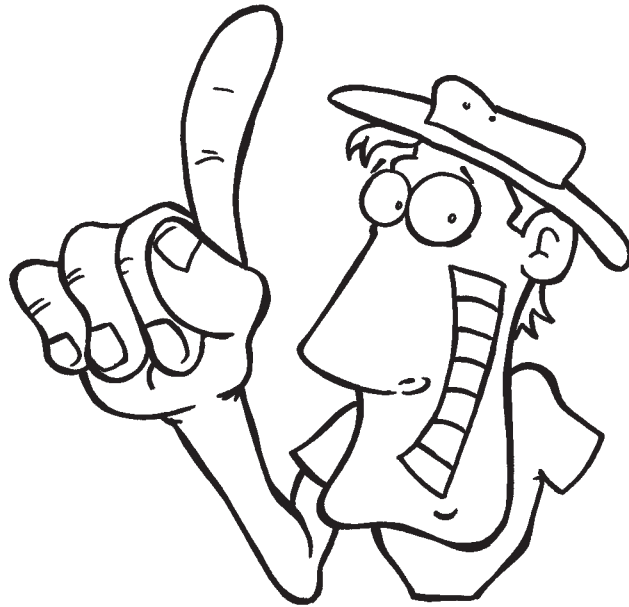
- Boy's toilets and PE change rooms
- Girl's toilets, disabled toilet and PE change rooms
- Staff rooms, offices, storerooms
- Classrooms and canteen
- Bubblers and outdoor taps
- Outdoor irrigation system and cleaning
- Other buildings – library, hall, gym ...

School water audit – your role



- Observe
- Measure
- Record
- Reflect
- Report
- Discuss
- Plan

Health and safety rules



- Speak quietly
- Walk in and between buildings
- Wash your hands after visiting toilet areas
- Keep your clothes dry
- Empty buckets or jugs of water onto the garden or grass
- Use equipment carefully ... stopwatch, tape measure
- **DO NOT** touch hot water taps

Lesson 5

Monitoring water use



Activities

Remind students the night before to bring in a copy of their family's water bill.

1. **This activity will require parental permission.** Using an overhead transparency or hard copy of Enviro Public School account, *Fact sheet - Monitoring water use*, discuss the various relevant elements of the account.
2. The students create a Neville cartoon strip using three pieces of information from the account.
3. The students compare the results of the data collected in Lesson 2 with the average daily usage graph on their family's latest water account. The students identify and record an explanation of any observed discrepancies e.g. visitors staying at the house, leaking taps, change in weather conditions.





Last bill	Payments	Balance	This bill	Total amount due
\$1122.15	\$1122.15	\$0.00	\$1070.10	\$1070.10

ENVIRO PUBLIC SCHOOL
 1 SAMPLE ST
 SACKVILLE NORTH NSW 2000

Please pay by
06/02/02
 Account number
9999 999

Blacktown Customer Service Centre
 3rd Fl, 22 Main St

Account for property

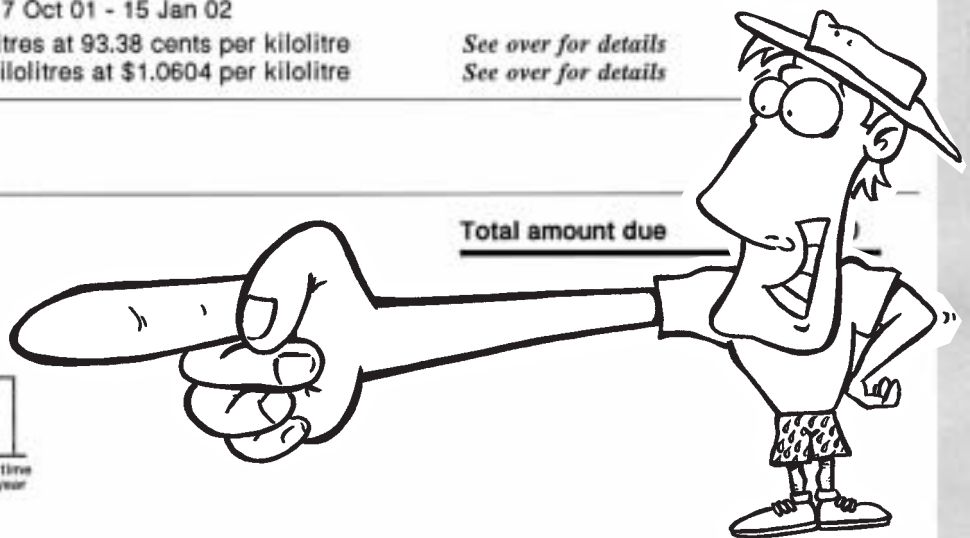
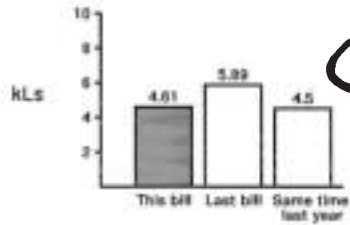
1 Sample St, Sackville North

Charges - GST free	1 Jan 02 - 31 Mar 02	\$
Water service		117.19
Sewerage service		392.59

Usage charge - GST free	17 Oct 01 - 15 Jan 02	
Water	415 kilolitres at 93.38 cents per kilolitre	<i>See over for details</i>
Sewer	163 kilolitres at \$1.0604 per kilolitre	<i>See over for details</i>

Other charges and credits
 Credit

Your average daily usage



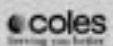
Total amount due

Continued overleaf

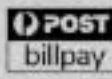


Billers Code: 45435
 Ref No: 9999 999 9999

BPAY: via your financial institution telephone or internet banking. Limit of \$1000 applies to Bankcard, Mastercard and Visa.



Coles: Use the ServiceATM at all Coles Supermarkets to pay your bill with Debit card, Visa, Mastercard or Bankcard. Limit of \$1000 applies to credit card.
 Biller ID: 615533 Customer ID: 9999 999 9999



*242 9999 999 9999

POSTbillpay: at any Australia Post Office by cash, cheque or EFTPOS. Or internet www.postbillpay.com.au
 Credit card limit \$1000.
 Billpay Code: 0242
 Ref No: 9999 999 9999

Direct Debit payments: for information about direct debit payments from your cheque or savings account, please ring 13 20 92 for an application or visit www.sydneywater.com.au

Total amount due
\$1070.10
 Please pay by
06/02/02
 Payment number
9999 999 9999

Account for property**1 Sample St, Sackville North**

Water Meter Details	Date read	Reading
This reading	15 Jan 02	2073 kilolitres
Last reading	17 Oct 01	1658 kilolitres
Total water used in 90 days was 415 kilolitres		
Meters on property used to calculate Service Charge: 1		
1 x 50.00mm meter		

Customer Information

- A discharge factor of 70.00% has been used to calculate the sewerage service in accordance to redress.
- Interest may be charged on overdue amounts at the current rate of including deferred
- We aim to provide a continuous supply of clean water and with our Customer Contract. If we fail to meet these standards to 5.30pm Monday to
- For customers in financial difficulty, Sydney Water may payment, instalment options and hardship relief. Condit For more information, please call 13 20 92.
- If you have any enquiries about this bill, please phone 13 20 Friday.

Emergency Service (available 24 hours)

Please ring 13 20 90 in cases

**Other payment options:**

Telephone payments: available only for amounts owing up to \$1000, by Bankcard, Mastercard or Visa.
Phone: 1300 859 651 (24 hour service)



Mailing your payment: please detach this slip and return it with your cheque payable to Sydney Water (no staples please). Send to:
Sydney Water
PO Box A82
Sydney South NSW 1231



Internet payments: available only for amounts owing up to \$1000, by Bankcard, Mastercard or Visa at: www.sydneywater.com.au

Payment number

9999 999 9999

Total amount due

\$1070.10

Paying in person: at any Sydney Water Customer Service Centre by cash, cheque, EFTPOS or credit card. Limit of \$1000 applies to credit card.

Changing your mailing address?

For changes to your mailing address, you can call 13 20 92, fax changes to (02) 9350 6015 or email changes to on.tap@sydneywater.com.au Be sure to quote your account number.

Lesson 6

Saving water at school



Activities

1. The class is divided into their water audit groups. Each group refers to their completed *Worksheet - School water audit* and *Fact sheet - Saving water at school* and completes *Worksheet - Saving water at school* for the Action Day.

Priority actions can include:

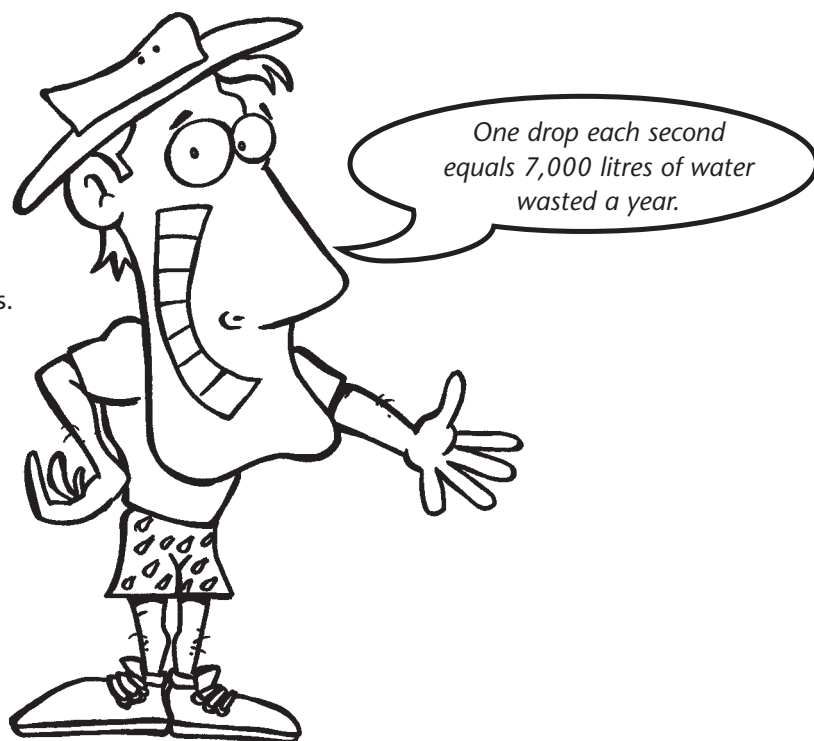
- Rosters for water monitors.
 - Taking an inventory of plant species.
 - Gardening initiatives including planting drought resistant plants, mulching.
 - Modifying cisterns.
 - Maintaining school body awareness of the water saving message.
2. As a class, the students prepare a School Water Action Plan to present to the School Environmental Management Committee. The groups need to cover the following aspects of the proposal:
- background information (including meter reading results)
 - water audit results
 - water saving suggestions e.g. spring loaded taps/bubblers, no vandal handles, smaller cisterns, plants
 - assigning responsibilities and completion dates for tasks.
3. As a class, the students develop a media campaign to advertise their Every Drop Counts Water Action Plan using *Worksheets - Saving water at school*. A media release could be sent to the local paper, included on the School website and in the newsletter.
4. The Every Drop Counts Coordinator runs the School Water Action Day with the assistance of the class teacher/Environmental Education teacher.



Saving water at school

You can be a water saver by:

- Reporting all leaking taps, bubblers and toilets.
- Using the half flush toilet button when you can.
- Using a bucket when washing paintbrushes.
- Turn all taps and bubblers off after using them.
- Rostering water monitors.
- Following your school's water action plan.



Be a water saving school by:

- Installing aerators on spring loaded taps.
- Installing dual flush toilets and motion sensor urinals.
- Reducing the amount of water used when flushing by putting a filled 2 litre juice container in toilet cisterns.
- Installing water efficient showerheads.
- Fixing all leaks quickly.
- Locking toilets overnight and at weekends.
- Installing vandal proof taps.
- Using a broom or blower vac when cleaning outside areas.
- Mulching garden areas and planting Australian native plants.
- Using tap timers or a controlled water irrigation system.
- Watering in the early morning or evening.
- Installing a rainwater tank.



Name:

Developing our Water Action Plan

My priority for actions - I will save water by

1. _____
2. _____
3. _____

Reasons for your choices:

The group's priority for actions - We will save water by

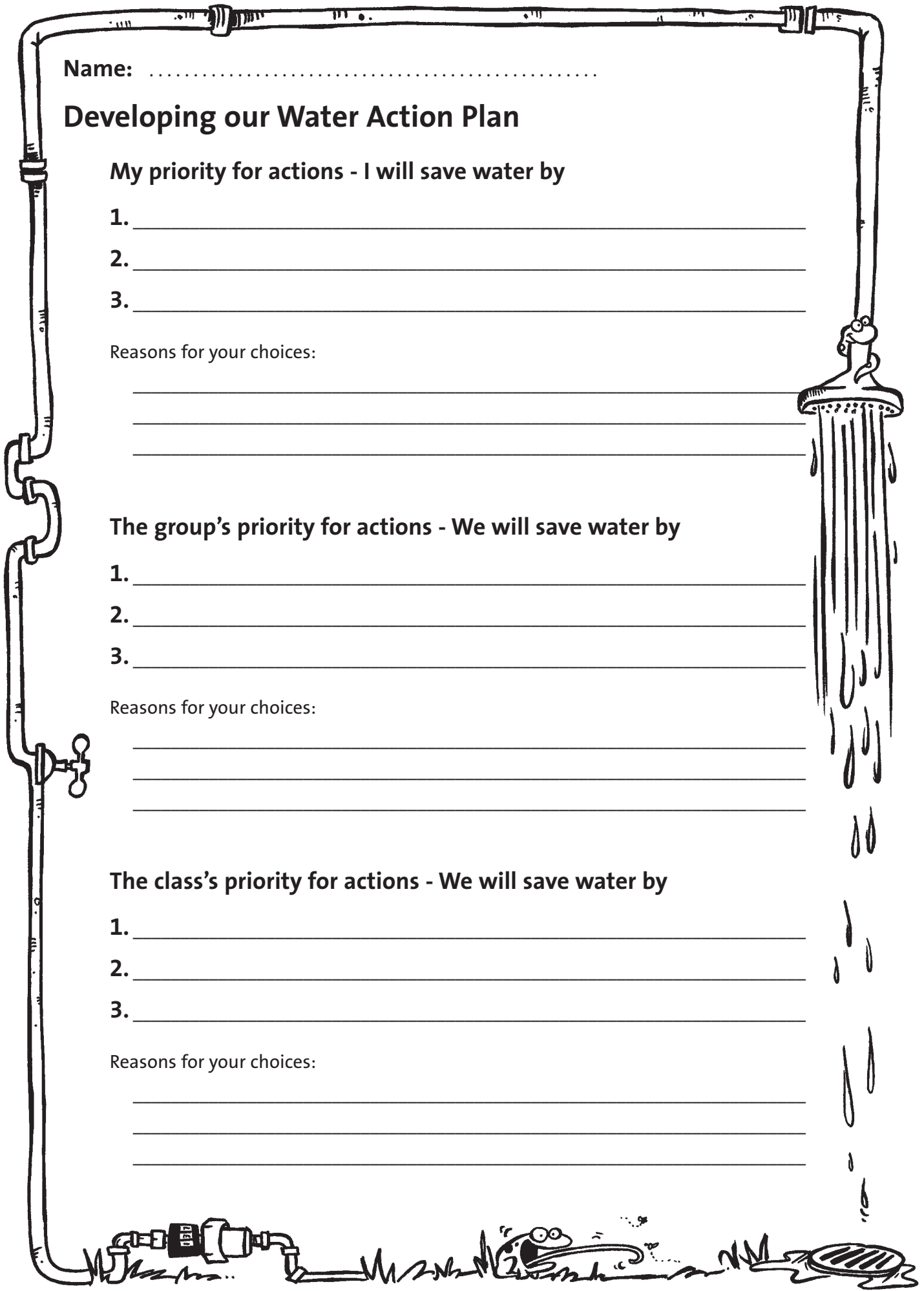
1. _____
2. _____
3. _____

Reasons for your choices:

The class's priority for actions - We will save water by

1. _____
2. _____
3. _____

Reasons for your choices:



School Water Action Plan

School _____ Date _____

Issue		Goal		Strategy
Priority	Problem	Action to be taken	Who is responsible?	When will it be completed?
				Cost

School Water Action Plan (continued)

Issue	Action to be taken		Strategy
	Priority	Problem	
	Who is responsible?	When will it be completed?	
			Cost

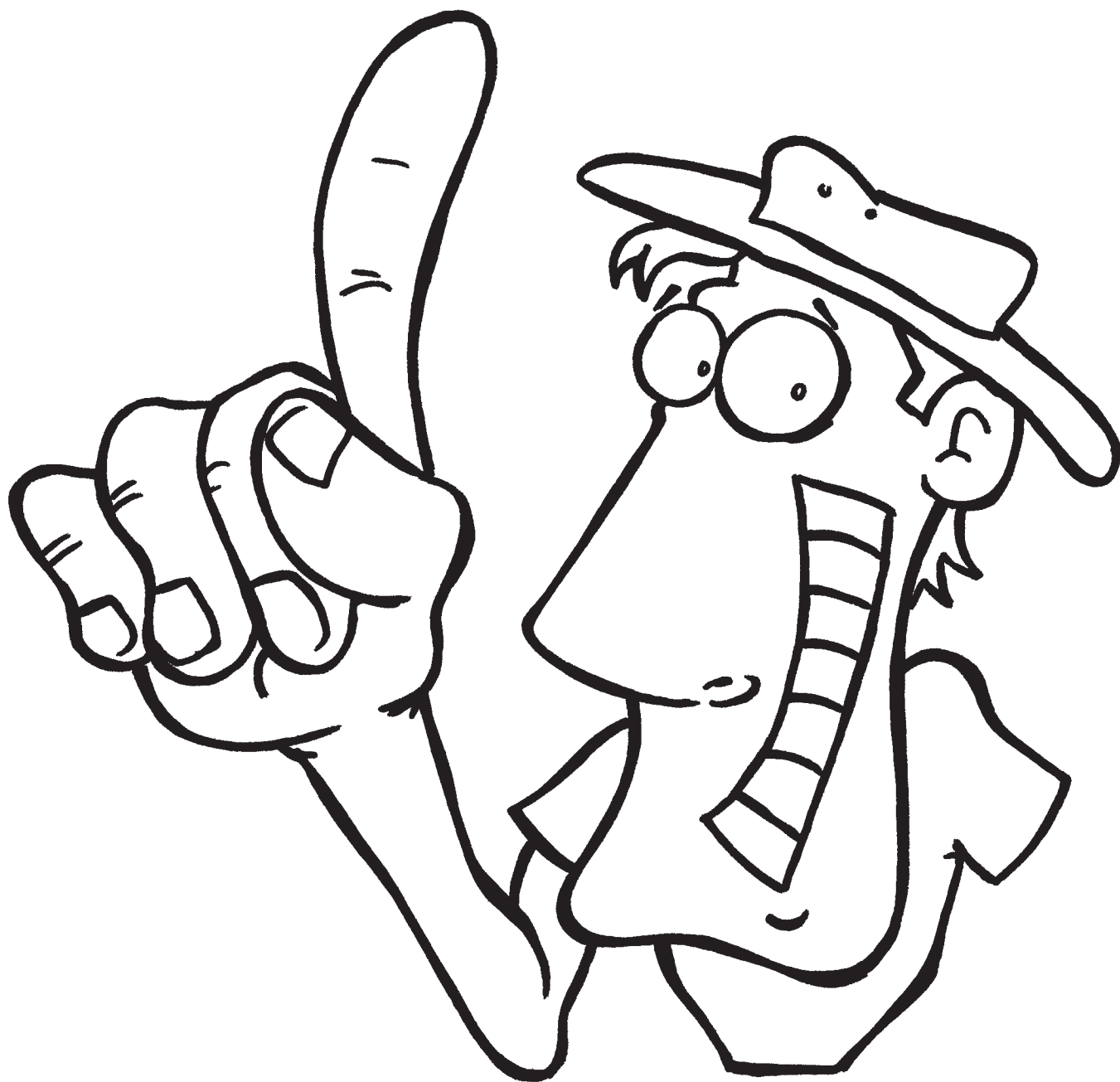
REPORT ALL
LEAKING TAPS
AND
BUBBLERS

TO YOUR
TEACHER!











Lesson 7

Every Drop Counts at home



Activities

1. The class investigates ways of using less water at home by reading *Fact sheet - Every Drop Counts at home*, visiting the Sydney Water education site and following the links to the Water Saver Challenge game (www.sydneywater.com.au>Ensuring the future>Water School).
 - After taking the challenge the students record for display the 10 points for saving water.
2. Using the 10 points for saving water, the students develop ways of sharing their new knowledge with family members before commencing their home water audit.
3. After completing the homework, the class discusses how their water saving actions have affected water consumption.

Homework

- On *Worksheet – How much water do we use at home?* the students record their home water meter readings for a week.
- Using the information from *Worksheet - Water and how we use it* (Lesson 2) and their water saving ideas the students talk to their family about ways they can use less water and save money on their water bills.
- As a family they use some of the water saving ideas on *Fact sheet – How to be a water wise family* to reduce water usage.
- On *Worksheet – How much water do we use at home now?* the student's record the next week's readings.



Every Drop Counts at home

In the bathroom

You can be a water saver by:

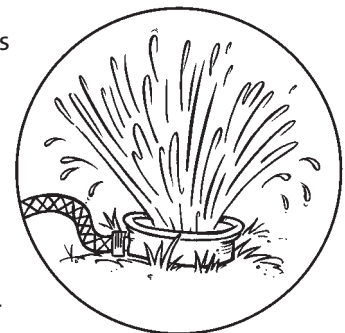
- Taking shorter showers.
- Turning off the tap when cleaning your teeth.
- Using less shampoo and soap because it is better for your skin, hair and the environment.
- Using environmentally friendly cleaning products, such as low phosphate detergents.
- Using a bin for your rubbish, don't put it down the sink or in the toilet.
- Using the half-flush toilet button when you can.
- Installing a water efficient showerhead when your old one needs replacing.
- Fixing all leaking taps.



In the garden and outside

You can be a water saver by:

- Watering the garden early in the morning or in the evening because less water evaporates when it is cooler.
- Watering the roots and soil around the plants rather than spraying the leaves and flowers.
- Using a trigger action hose or watering can instead of a running hose or sprinkler.
- Fitting a timer to your sprinkler.
- Planting Australian natives, they need less water.
- Watering less often to encourage plants and lawns to grow deeper roots. A good soaking every now and then will help make plants and lawns healthier during dry periods.
- Using a broom and not a hose to clean paths and driveways.
- Washing your car on the lawn.
- Finding alternatives to fertilisers, anti-flea rinses and other pesticides that may contain harmful chemicals.
- Fixing all leaking taps.



In the kitchen

You can be a water saver by:

- Using a plug in the sink when you rinse fruit and vegetables.
- Fixing all leaking taps.
- Using a fats and oils container, like a used milk carton, for all your old cooking oils. When it's full, put it in the rubbish bin.
- Using environmentally friendly cleaning products such as low phosphate detergents.
- Having a composting system for food scraps.
- Using a sink strainer to minimise rubbish being washed down the sink.
- Fully loading the dishwasher and washing machine before using them.



How much water do we use at home?

Locate, read and record your home water meter reading on Monday night, Day 1, after dinner and showers/bath. In seven days time, on Monday night after dinner and shower/bath record the water meter reading. Subtract the first Monday reading from the second Monday reading to calculate the amount of water used for the week.

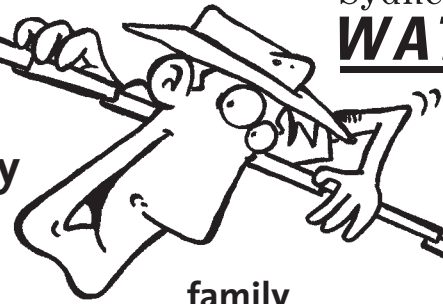
Meter reading

Reading – Day 8, Monday night	
Reading – Day 1, Monday night	
Water use	



How to be a water wise family

Our water wise family



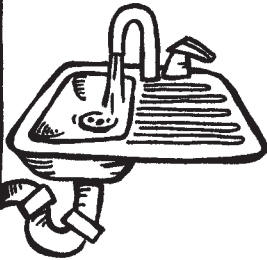
We the _____ family

agree to do what we can to become water wise.

Please tick the actions you as a family are prepared to take. Over time check your water bills and see if you have reduced the amount of water used in your home.

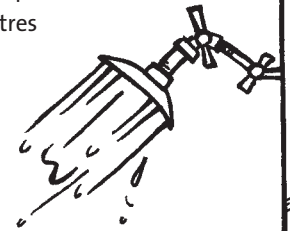
In the kitchen we will...

- Have the sink plug in place while we wash vegetables and save up to 5 litres.
- Use a sink strainer and a bin for rubbish and not the sink.
- Make sure our dishwasher is full before use and save up to 40 litres a day.
- Look out for environmentally friendly cleaning products, such as phosphate free detergents.
- Have a 'fats and oils' container to collect used fats and oils for the rubbish bin.



Around the house we will...

- Use a broom and not a hose to clean our pathways, and save 100 litres every five minutes.
- Fix all leaking taps. A tap that drips 25 times in a minute wastes 9 litres every day.
- Wash our car on the lawn using a bucket, instead of on the road or driveway with a hose. This will stop detergents entering the drain and ending up in our waterways.
- Find alternatives to fertilisers and pesticides which may contain harmful chemicals. These soak into the ground and wash into local waterways.

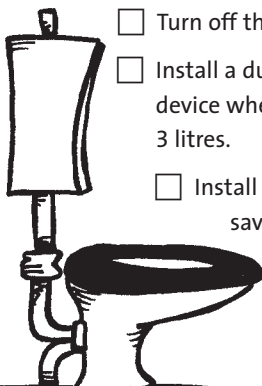


In the laundry we will...

- Wash only full loads. A washing machine can use up to 150 litres a load.
- Put in the plug and use only a small amount of water for hand washables. By not hand washing under a running tap we will save 50 litres every five minutes.

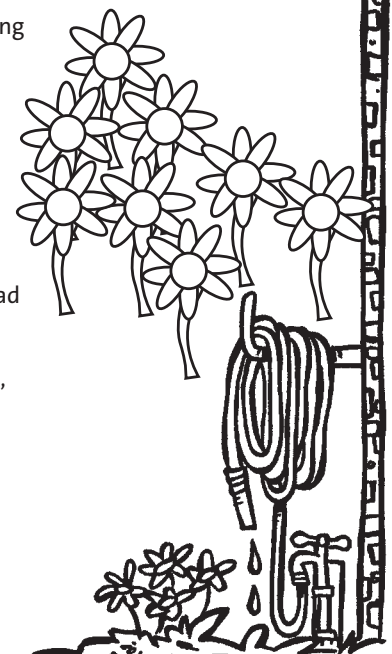
In the bathroom we will...

- Take shorter showers.
- Turn off the tap when cleaning our teeth.
- Install a dual flush toilet or water saving device when possible. A half flush uses only 3 litres.
- Install water saving showerheads and save up to 180 litres a day.



In the garden we will...

- Water the garden early in the morning or in the evening when it's cool.
- Water the roots and soil around the plants not the leaves and flowers.
- Use a trigger action hose for watering instead of a running hose.
- Plant Australian natives, they need less water.



Check out Sydney Water's Every Drop Counts program at www.sydneywater.com.au for tips on how to save time, money and water in the garden.

How much water do we use at home now?

Write down your family's water use from *Worksheet: How much water do we use at home*.

After your family has started their water saving actions, locate, read and record your water meter reading on Monday night, Day 1, after dinner and showers/bath. In seven days time, on Monday night, after dinner and showers/bath record the water meter reading. Subtract first Monday reading from second Monday reading to calculate the amount of water used during the week.

Meter reading

Reading – Day 8, Monday night	
Reading – Day 1, Monday night	
Water use	

Water usage

Before my family started our water saving actions

After my family started our water saving actions

My family saved

Write or create a water saving slogan to encourage your family to continue using less water.



Lesson 8

Spreading the word



Activities

1. The students inform the younger members of the school about saving water. Activities to spread the word may include:

- writing stories and/or making information books for younger children
- role plays
- murals
- designing signs about saving water.

The students photograph or film the steps they took in educating the younger children. This record forms the basis of a written report sent to Sydney Water, local papers, regional radio and TV stations and environmental magazines.

2. The teacher and students decide when to conduct the follow-up meter readings. Using *Worksheet - Follow-up meter readings* the follow-up meter readings are faxed to the Every Drop Counts Coordinator on 9350 5587. Compare your follow-up meter readings to those from Lesson 3.

3. The teacher, students and School Environmental Committee collate the original data and follow-up results from the audits and meter readings. These documents, with the class action plans and a brief report of the action day form the SEMP for water. A copy of the report is posted to Sydney Water Every Drop Counts Coordinator, Level 13, PO Box 53, Sydney South NSW 1232.

Remember to check your bill each quarter to see how your consumption drops as you become water wise.



Follow-up meter readings

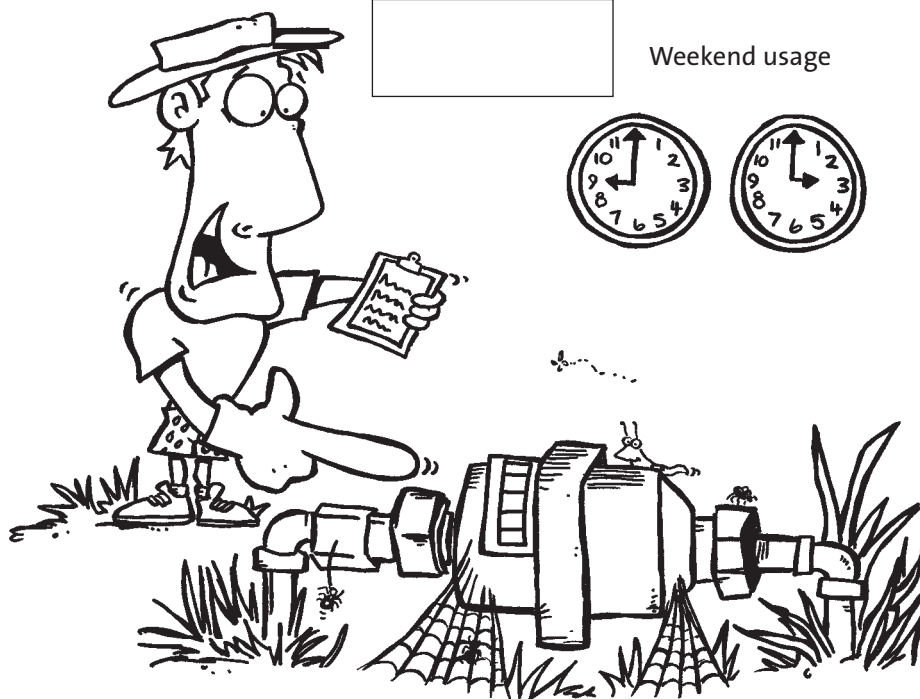
Use the school water meter/s to measure the amount of water used over two consecutive weeks.

Week 1 - start date ___/___/___

	Monday	Tuesday	Wednesday	Thursday	Friday	
2nd reading (school finish)						
1st reading (school start)						
Daily use (2nd reading – 1st reading)						
						TOTAL

Weekend usage

		Monday morning reading from week 2
—		School week total
		Weekend usage



IMPORTANT: Was there any water use at night? (This means that your school finish reading would be different to your school start reading for the next day). Could this water be explained by cleaning or irrigation? If not this could mean that taps have been left on overnight or the school has leaky pipes.

Glossary

Biodegradable

A substance that can be broken down into harmless products in the environment.

Biosolids

Solids from wastewater treatment that have been processed into products suitable for beneficial use such as agriculture or forestry.

Catchment

The area drained by a stream, lake or other body of water. Frequently used to refer to areas which feed into dams. May also refer to areas served by a sewerage or stormwater system.

Coastal communities

Coastal communities include the households and industries situated within the coastal catchment areas. This may include inland settlements that are still on the coastal plain.

Conservation

Use, management and protection of resources so that they are not degraded, depleted or wasted and are available on a sustainable basis for present and future generations.

Deepwater ocean outfall

A submarine tunnel or pipeline that carries treated wastewater away from the coast into deep ocean waters where it is diluted and dispersed.

Disinfection

Inactivation (killing) of pathogens or organisms capable of causing infectious disease, by chemical or physical processes.

Drinking water

Water intended primarily for human consumption but which has other domestic uses.

Ecosystem

A community of organisms, interacting with one another, plus the environment in which they live. Processes occurring within an ecosystem are the flow of energy by food chains and food webs and nutrient cycling. An ecosystem may be a pond that is dry for half the year, a lake or even a planet.

Effluent

Liquid left over after sewage treatment.

Effluent reuse

Process where treated wastewater is recycled for useful purposes and is not discharged to a natural waterway. The treated water may be used in industry or for watering golf courses or plants.

Estuary

The lowermost part of a river system that is a mixture of fresh water and sea water.

Evaporation

Liquid water from rivers, dams and oceans is converted by the sun to water vapour which rises back into the atmosphere as a gas.

Filtration

A process for removing particles from a solution by passing it through a porous structure or medium, such as a screen, membrane, sand or gravel.

Food chain

A 'chain' of organisms through which energy is transferred. Each organism in this chain feeds on and obtains energy from another organism preceding it, and in turn is eaten by, and provides energy for, the one following it (e.g. plant eaten by herbivore, then herbivore eaten by carnivore).

Greenhouse effect

Warming of the Earth's atmosphere as a result of increases in carbon dioxide and other gases.

Grit

Hard and heavier solid matter in wastewater. It is generally inorganic. Examples include sand, gravel, ash, glass and metal fragments.

Ground water

Water that is found below the surface, usually in porous rock or soil or in underground aquifers.

Infiltration

Water that soaks into the ground during and after rain.

Inland communities

Inland communities include the households and industry located in areas where water flows to inland streams, rivers and lakes.

Pollution

Any harmful or undesirable change in the physical, chemical or biological quality of air, water or soil as a result of the release of chemicals, radioactivity, heat and large amounts of organic matter.

Recycling

Collecting and reprocessing a resource so that it can be used again.

Reservoirs

Water is transferred from the dams and treatment plants either by gravity or pumping stations to the water storage reservoirs. These reservoirs are man-made water storage areas, usually on high land. From these storage facilities the water flows through a system of watermains and smaller pipes to homes, shops, factories, schools and public places.

Run-off

Water that flows across the land surface and does not soak into the ground.

Screenings

Materials removed from wastewater by screening processes, e.g. timber, rags, plastic and condoms.

Scum

Any material that floats to the surface of wastewater during treatment, usually removed in sedimentation tanks.

Sediment

Soil or other particles that settle to the bottom of lakes, rivers, oceans and other waters.

Sedimentation

A treatment process which allows sediment to settle out of water or wastewater.

Sewage

The wastewater from homes, offices, shops, factories and other premises discharged to the sewer. About 99 per cent of sewage is water.

Sewage overflow

A release of sewage from a designed relief point to avoid sewage flowing back into houses.

Sewage treatment plant

Sewage treatment plants treat wastewater, also known as sewage, from the sewerage system. Once the waste is treated it is then either discharged to the environment or it is recycled as effluent reuse.

Sewerage system

The network of pipes, pumping stations and treatment plants used to collect, transport, treat and discharge sewage.

Sludge

Solid matter that is removed during wastewater or water treatment. It can be processed into a material that can be beneficially used (Biosolids).

Storage dam

Sydney Water uses a large and complex network of dams to provide a reliable source of drinking water for the regions of Sydney, Illawarra and the Blue Mountains.

The Sydney Catchment Authority is a statutory body set up by the NSW Government to manage and protect Sydney's water supply catchments, dams and associated infrastructure.

Water drains from the catchment areas and feeds into storage dams, mostly by streams or rivers. The water is then stored in the dam until it is needed. This can be months or even years. It is then transferred by water pumping stations to a water filtration plant, then to below and above ground reservoirs to supply the community with water.

Stormwater

Rainwater which runs off the land, frequently carrying various forms of pollution such as rubbish, animal droppings and dissolved chemicals. This untreated water is carried in stormwater channels and discharged directly into creeks, rivers, the harbour and the ocean.

Stormwater system

The system of pipes, canals and other channels used to carry stormwater to bodies of water, such as rivers or oceans. The system does not usually involve any treatment.

Wastewater

Another name for sewage.

Wastewater treatment: Primary

The initial stage of wastewater treatment in which floating or settleable solids are removed by screening and sedimentation.

Wastewater treatment: Secondary

The second stage of wastewater treatment involving the capture and removal of dissolved fine organic solids.

Wastewater treatment: Tertiary

The third stage in the purification of wastewater. This process consists largely of the removal of nutrients and any remaining suspended solids and may include disinfection of the effluent.

Water filtration plants (WFP)

Water filtration plants are treatment facilities that improve water quality. Impurities are removed through a process known as filtration where incoming water is passed through a porous structure or medium, such as a screen, membrane, sand or gravel.

Evaluation

In order for us to better meet your educational needs could you please complete and fax this evaluation sheet to Schools Education, Sydney Water 9350 5587. Thank you for your help.

Name _____

School _____

Address _____

Phone _____ Fax _____

E-mail _____

1. Did your class complete all of the lessons?

Yes (go to question 3)

No

2. If not, which ones did they miss? (please specify)

3. Of the 8 lessons, which did you find the most effective?

- Lesson 1: Precious water
- Lesson 2: Water and how we use it
- Lesson 3: Managing the water supply
- Lesson 4: School water audit
- Lesson 5: Monitoring water use
- Lesson 6: Saving water at school
- Lesson 7: Every Drop Counts at home
- Lesson 8: Spreading the word

4. Why did you find this lesson the most effective? (please explain)

5. Of the 8 lessons, which did you find the least effective?

- Lesson 1: Precious water
- Lesson 2: Water and how we use it
- Lesson 3: Managing the water supply
- Lesson 4: School water audit
- Lesson 5: Monitoring water use
- Lesson 6: Saving water at school
- Lesson 7: Every Drop Counts at home
- Lesson 8: Spreading the word

6. Why did you find this lesson the least effective?

7. Did you have any practical problems implementing the Every Drop Counts in Schools program, e.g. lack of funding, difficulty with plumbers or the general assistant, no support from the Principal? (please specify)

8. Can you identify any changes in student or staff behaviour as a result of implementing Every Drop Counts in Schools?

9. Are you aware of any other resources that can be used to supplement the activities in this program?

10. Did you feel this resource missed any essential activities/concepts?

11. In your opinion could anything be added to this resource to make it more effective?

Every Drop Counts in Schools

A comprehensive teaching package for Stage 2/3 students

Every Drop Counts in Schools is a teaching package developed and written specifically for Stage 2/3 students. It consists of eight lesson plans, including a detailed water audit, in which students and teachers learn about how precious water is, where water is being wasted in their school and what they can do about it.

Every Drop Counts in Schools also addresses the requirements of the Environmental Education Policy for Schools and will help your school in its preparation of the School Environmental Management Plan (SEMP).

The lesson plans take an integrated theme approach linked to the Key Learning Areas (KLAs) of Human Society & Its Environment (HSIE), Science and Technology, English and Mathematics.

The package guides teachers and students in using water audit results to develop, implement and evaluate the water action plan.

The package includes:

- lesson plans
- worksheets
- fact sheets
- syllabus outcomes and indicators

For more information about **Every Drop Counts in Schools** or other Sydney Water education materials visit our website www.sydneywater.com.au or phone 1800 724 650.

This package was developed specifically to meet outcomes identified in the NSW Primary Curriculum.

