Water is precious — we need water

Water is precious — we need water is a programme about water use and water conservation for use in Year 3 and 4 classes on the Kāpiti Coast.

Introduction

On the Kāpiti Coast, everyone recognises water is a resource we must use wisely. We need to make sure we, and future generations, have a reliable, quality water supply, as well as healthy streams, rivers and lakes.

Since 2011, the Kāpiti Coast District Council has been working with iwi and educators to develop water education programmes for young people.

The Water Education Facilitator (WEF), who can be contacted at works with Early Child Education (ECE) teachers and teachers to develop and implement water education programmes for young people and to assist centres and schools to be efficient users of water. They can be contacted on watered@kapiticoast.govt.nz.

A series of learning programmes focusing on water use on the Kāpiti Coast has been developed for ECE to Year 9. Each learning programme is stand-alone and is intended to be adapted by ECE educators or teachers to meet the needs of their children or students. Collectively, the series of resources provide sequential learning for young people as they develop an understanding.

Learning intention

Students understand that water is precious and that we all need to use water safely and wisely.

Activities are provided so students can investigate water and practise using water safely and wisely.

Key questions that are addressed in the learning programme are:

- What is water?
- Where is water found?
- Why do we need water?
- How do we capture, treat and use water?
- How do we conserve water or use water wisely?

Water is precious — we need water

Produced by Kāpiti Coast District Council.
www.kapiti.coast.govt.nz

Overview of *Water is precious — we need water*

***Water is precious — we need water* is a programme about water for use in Year 3 and 4 classes at primary schools on the Kāpiti Coast. It is a cross-curricula resource that can meet level 1, 2 and 3 Achievement Objectives in English, Science, Social Studies, Health and The Arts curricula.**

The learning programme is in six sections:

1. Water is precious

An introduction to the concept that water is precious and an exploration of what your students know about water and what else to find out about water. Students briefly explore the cultural significance of water for themselves and for local iwi.

2. What is water?

An investigation of the physical properties of water that extends to students developing an understanding of the water cycle.

3. We need water to live

An exploration of the fact that all animals and plants need water to live and why we need water.

4. Three waters – drinking water, stormwater and wastewater

An introduction to the safe drinking water, and stormwater and wastewater systems on the Kāpiti Coast.

5. Being waterwise and conserving water

An investigation of ways to use water wisely and conserving water at home and at school.

6. Taking action to conserve or value water

Students taking action at home and/or school to conserve or value water.

It is not expected that a school will use all the activities provided but that teachers will select the most suitable activities to build a programme that meets the identified needs of their students, families, school and local area.

Modelling waterwise behaviour

Before your class or your school begin this learning programme about water use and water conservation, your staff may want to discuss:

- how your school values water;
- ways the school currently conserves water;
- any infrastructure issues your school has that impacts on how the school uses and conserves water;
- a whole school approach to valuing and conserving water;
- how the staff currently model waterwise behaviour and valuing water; and
- what type and level of action your students may take at home and school after they have completed their learning about the value of water and the need to conserve water.

Involving parents and caregivers

This work involves your students thinking about how they use, value and conserve water at school and in their homes.

Your students will be discussing their learning at home and doing some simple investigations at home. You may want to:

- inform parents about the intent of the learning programme and indicate that your students will be investigating how water is used at home;
- invite parents to come to the school to see and hear about what the students have learnt; and
- attend a talk with speakers from the Kāpiti Coast District Council that describes ways to conserve water, use energy efficiently and minimise waste.

Water is precious — we need water

Provision of water services

The Kāpiti Coast District Council is responsible for providing:

- a supply of safe drinking water;
- stormwater systems remove water after heavy rain; and
- wastewater removal and treatment systems.

Kāpiti Coast residents pay for these services within their rates. Different water services are provided in different areas on the Coast**.**

Water issues on the Kāpiti Coast

Teachers are invited to read Water Issues on the Kāpiti Coast page 24 as background before they teach the *Water is precious* learning programme.

Partnership with local iwi

The Council is proud of its relationship with the tāngata whenua. A Memorandum of Partnership between the three iwi (Ngāti Raukawa, Āti Awa ki Whakarongotai and Ngāti Toa) and the Council has been in place since 1994. The Memorandum guides the relationship between Council and tāngata whenua. The goal of the Memorandum is to forge a relationship of mutual benefit between the Council and tāngata whenua and create an effective and meaningful partnership.

Background information for teachers and students

The Kāpiti Coast District Council website www.kapiticoast.govt.nz contains useful information for teachers and students.

If teachers have specific questions, requests for loan resources or want to discuss their *Water is precious* learning programme they can contact the Water Education Facilitator at watered@kapitcoast.govt.nz

Acknowledgements.

The Kāpiti Coast District Council would like to thank everyone who has been involved in the development of the *Water is precious* learning programmes.

This learning programme was written by Anne Brunt. Photographs were provided by Anne Brunt, Nicola Easthope, Kapanui School, Raumati South School, Liz Stretton and Greater Wellington Regional Council.

A number of territorial authorities in New Zealand and Australia have developed educational programmes about water. Over time a number of activities have been created and modified for use and it is no longer possible to acknowledge authorship of specific activities. The Kāpiti Coast District Council would like to acknowledge the cooperation of local and regional Councils that has allowed the free exchange and use of material so we can all create quality educational programmes suited to our local areas. Thanks to World Vision New Zealand for permission to use their resources.

Water is precious — we need water

Assistance for schools from the Kāpiti Coast District Council Green Team

Members of the Green Team can come to your school and offer FREE advice that focus on sustainable use of resources.

The Green Team can work with your staff to:

- complete a review of how efficiently your centre uses water and develop practical suggestions on how your school can reduce its water usage. (Water Conservation Adviser);
- complete an energy efficiency review and develop practical suggestions on how your school can be more energy efficient, reduce heating costs and be warmer, drier and Eco-design Adviser);
- develop sustainable gardens (Green Gardener);
- become an enviroschool (Enviroschools Facilitator);
- implement a water education programme (Water Education Facilitator); and
- develop and implement a waste minimisation programme (Waste Minimisation Officer).

Free services for families

Families can also access the services of the Green Gardener, the Water Conservation Adviser and the Eco-design Adviser.

The Water Education Facilitator will provide brochures that outline these FREE services for families.

Talks for parents and caregivers

Staff from Kāpiti Coast District Council's Green Team can come to your centre to deliver a presentation and a question and answer session that provides:

- an explanation of how our drinking water is treated (DVD)
- a discussion about water issues in Kāpiti and Council initiatives to encourage people to conserve water
- tips on how to use water efficiently and conserve water
- advice on how to make homes warmer, drier and healthier
- advice on how to minimise and dispose of household waste.

In terms 1 and 4, schools will be contacted by the Water Education Facilitator to ask if they want to invite their parents and carers to attend this presentation by the Kāpiti Coast District Council's Green Team.

Water is precious — we need water

Curriculum links

Values highlighted in this unit	How students will be encouraged to develop the selected value or values during the unit
Respect Innovation, enquiry and curiosity Care Integrity	Students will be learning to respect, value and care for water, to use water safely and to conserve water as they carry out a range of activities. Students will carry out a range of experiments and investigations to explore water as a solid, liquid and gas.

Excellence – aiming high, persevering **Innovation**, enquiry and curiosity **Diversity** – culture, language, heritage **Respect** – for themselves and others **Equity** – fairness and social justice **Community** and participation for the common good **Care** for the environment **Integrity** – accountability, honesty, acting ethically

Key competencies highlighted in this unit	How students will be encouraged to develop the selected competency or competencies during the unit
Managing self Thinking Relating to others Participating and contributing Using language, symbols and texts	Student will be encouraged to take responsibility for their own actions to use water wisely and conserve water. Students will use oral and written language to describe water and explain water related concepts, terms and processes. Students will measure water in litres. Students will work together to determine why water is important in their lives and to develop an understanding of water as a finite resource. They will make sense of information from a range of sources including observation, use of their senses, and reading. Students will explore what it would be like to live in a country that does not have an adequate supply of clean water and make comparisons with their own lives.

Managing self – self-motivation, personal goals, appropriate behaviour, resourcefulness, sense of self and importance of heritage **Relating to others** – listen actively, recognise different points of view, negotiate, share ideas **Participating and contributing** – balancing rights, roles and responsibilities, and responding appropriately as a group member. **Thinking** – using creative, critical, metacognitive and reflective processes, drawing on personal knowledge and intuitions. **Using language, symbols, and texts** – interpreting language and symbols, using ICT, recognising how choices of language and symbol affect people's understanding.

Water is precious — we need water

Reading resources

Journal stories and connections

The river, water and the water cycle

The story of Rangi and Papa
by M Roberts
SJ, Pt. 1, No. 5, 1994
Pages 18 – 23 (RA 8 – 9)

The shapes of water
by G Shannon
SJ, Pt. 1, No. 4, 1995
Pages 17 – 19 (RA 9 – 10)

An interview with a glass of water
by J James
CN, No. 2, 2002
Pages 2 - 5

The water cycle
by W Rea
CN, No. 2, 2002
Pages 6 – 9

Tāwhirimātea
by N Takao
CN, No. 1, 2004
Pages 26 – 32

Hard ice, soft ice
by B O'Brien
CN No. 2, 2004
Pages 18 – 21

A closer look
Play by P Werry
SJ l2
Aug 2011

Awa
Poem by G O'Connell
SJ L2 Aug 2012

Animals

He kōrero mo te pīngao
by B Meads
SJ, Pt. 1, No. 2, 2001
Pages 14 – 19 (RA 8 – 9)

Huhu escape
by J Maguiness
SJ, Pt. 1, No. 1, 2002
Pages 10 – 11 (RA < 8)

Te pūpū harakeke
by S Waitai-Cherrington
SJ, Pt. 2, No. 3, 2003
Pages 26 – 29 (RA 10 – 12)

Wetas with backpacks
by P Quinn
JJ, No. 13, 1995
Pages 22 – 25 (< 8)

Counting koura
By B Gore
CN, No. 1, 2007 1
Pages 8 - 25

Fish and fishing

Queen of the river
by K Wehipeihana
SJ, Pt. 1, No. 1, 1999
Pages 13 – 17 (RA 8.5 – 9.5)

The tame eels of Anatoki
by A Belcher
SJ, Pt. 1, No. 4, 2003
Pages 22 – 25 (RA 8 – 9)

The puru tuna
by M Waiomio
SJ, Pt. 4, No. 2, 2001
Pages 30– 32 (RA 9.5 – 10.5)

Granny's puna
by I Toia
SJ, PT. 3, No. 4, 2003
Pages 8 – 11 (RA 9 – 10)

Whitebaiting
by J Trafford
SJ, Pt. 1, No. 4, 2004
Pages 2 – 7 (RA 8 – 9)

Hinaki
by J Trafford
SL No. 4, 2000
Pages 2 – 16

Kutai
Article by R Calman
SJ L2 Aug 2012

Kutai fritters
Story by C Mataio
SJ L2 Aug 2012

Human impacts and water conservation

Don't waste the water
by J MacGregor
SJ, Pt. 3, No. 3, 1999
Pages 24-27 (RA 8.5 – 9.5)

Pest fish
by D Somerset
SJ, Pt. 2, No. 4, 2005
Pages 7 - 10 (RA 8.5 – 9.5)

Water power
by S Carrod
SJ, Pt. 2, No. 4, 2005
Pages 11 - 15 (RA 9 – 10)

World's water running out
by P Werry
SJ, Pt. 2, No.1, 2007
Pages 18 – 20 (RA 9.5 – 10.5)

Plastic fantastic
by P Werry
SJ, Pt. 3, No. 3, 2007
Pages 2 – 9 (RA 10 – 12)

Easy as child's play
by P Werry
CN, No. 2, 2002
Pages 15-18

Wonderful water
by P Werry
CN, No. 3, 2004
Pages 20 – 27

Trees for birds
by W Cowley
SJ, Pt. 2, No. 4, 1997
Pages 25 – 31 (RA 8.5 – 9.5)
Pages 15 -18

Seeds for birds
by S Gibbison
SJ, Pt. 2, No. 4, 2007
Pages 7 – 13 (RA 8.5 – 9.5)

Operation flax
by D Noonan
SJ, Pt. 3, No. 1, 2008
Pages 22 – 27 (RA 9 -10)

Water wardens
by A Bagnall
CN, No. 2, 2002
Pages 10 - 14

Eco-friendly inventions
by R Huber
CN, No. 3, 2004
Pages 28 – 32

Our Pātaka
By H Bell
CN, No. 3, 2005
Pages 2 – 9

A new life for old machines
by R Hipkins
CN, No. 3, 2007
Pages 28 – 32

Weather

Hard ice, soft ice
by B O'Brien
CN No. 2, 2004
Pages 18 – 21

Making puddles
S Averil
CN 1 2000

Produced by Kāpiti Coast District Council.
www.kapiti.coast.govt.nz

Section 1: Water is precious

This section introduces the concept that water is precious and explores what your students know about water and want to find out about water. Activities are provided to explore the cultural significance of water for your students, their families and local iwi.

Introducing water is precious - he tāonga te wai

In this activity students work in groups with a set of four photographs and work out why they think water is precious.

Equipment

- copies of the provided photograph sheets

- Ask your students if and where they have seen the logo on the top of their photograph sheet.
- Discuss the concept that people and things can be precious to us, ask your students to identify people and things that are precious or are treasures in their lives.
- Place your students in groups and give each group a set of starter photographs. Ask your students to use the photographs and their own ideas to write as many as possible answers to complete the sentence starter.

  Water is precious because ...

- Record your students' ideas and display them. Add new ideas to this display as the students work through your learning programme. Explain to the students that at the end of the learning programme they will revisit their ideas and develop their own explanation of why water is precious.

Big ideas

Water is a precious resource.

Water has cultural significance for Māori.

Water has significance for many cultures.

vocabulary

precious
treasure
river
lake
sea

kupu

taonga	treasure
wai	water
awa	river
roto	lake
moana	sea

Water is precious — we need water

Water is precious — we need water

Water is precious — we need water

Water is precious — we need water

Produced by Kāpiti Coast District Council.
www.kapiti.coast.govt.nz

Water is precious — we need water

Shaping your learning programme

Find out what your students know about water and what they want to find out about water and build your learning programme around this. You could use a KLM chart to do this .

As you are working through this learning programme build two visual wall displays:

- a word wall of vocabulary about water
- a wonderful water wall where student work can be displayed.

Big ideas

Water is regarded as a treasure or tāonga by Māori.

Being kaitiaki or guardians or stewards of our waterways is important to Māori and our local iwi.

Exploring the cultural significance of water

Valuing and respecting water is important in many cultures. This section encourages you to explore how valuing water is significant to local tangata whenua and to families with children in your class or school.

Value of water to Māori

The Water Education Facilitator can organise contact with a representative from your local iwi. They could visit your school or a local stream or river with your students to discuss the importance of water and local water environments to Māori.. The iwi representative can explain the names of local areas, streams and rivers and their role as kaitiaki or guardians of waterways.

Valuing our local waterways (streams, rivers, lakes or seas)

- Ask your students to identify where you can find natural waterways and identify local streams, rivers, lakes and beaches.
- Plan and conduct a visit to a local waterway and talk about what you can see, the plants and animals that live in, on or around the waterway and how the community values and uses the waterway.

kupu

kaitiaki	guardians
Iwi	tribe
tāonga	treasure
wai	water
awa	river
roto	lake
moana	sea

Section 2: What is water?

This section has a range of activities that has students investigate water as a solid, liquid and a gas and concludes with the students developing an understanding of the natural water cycle.
*TKI Science Concepts Book 15 Where's the weather? (*evaporation and condensation at L1 and 2)
TKI Science Concepts Book 58 Ice: melting and freezing. (L1 and 2) support this learning.

Exploring water as a liquid

Equipment: (per group)

- a two litre plastic milk container filled with water;
- a measuring jug with a litre scale; and
- clear glasses that students can drink from.

- Give groups of students a milk container filled with tap water and glasses and explain that the water in the container is tap water so it is safe to drink.
- Ask the students to pour themselves a glass of water and then describe the water by answering :
  - What can I see?
  - What can I smell?
  - What can I taste?
  - What can I feel if I pour water on my hand?
- Develop a definition for water that includes the terms liquid, and colourless or clear.

Measuring water in litres and millilitres

Equipment: (per group)

- a two litre plastic milk containers;
- a measuring jug with a litre scale and/ or measuring cylinders that measure in litres and millilitres;
- soft drink and other bottles or liquid containers of various sizes including irregular shaped bottles and liquid containers and small and large buckets;
- scales; and
- a source of water.

Big ideas

Water is clear or colourless liquid that can be measured in litres.

Water has no shape.

Water has weight.

vocabulary

clear or colourless
liquid
litre

kupu

kanokore clear or colourless
liquid wai

Measuring water continued

- Hold up a full one litre milk container and a two litre milk container of water and ask how much water is the containers. Discuss what items we buy or use that are measured in litres e.g. fruit juice, milk, soft drink, petrol or diesel. Look at the labels on a range of soft drink and other bottles used to supply liquids used in cooking e.g. cooking oil or vinegar.
- Discuss the idea that all liquids can be measured in litres and parts of a litre or millilitres, usually abbreviated to mls.
- Ask the students what shape water has. Pour some water into an unusual shaped container and discuss the idea that water and other liquids have no shape. They take the shape of the container they are placed in.
- Have your students think about the number of litres of water it might take to fill objects like their bath, your school pool, a school water tank, the hot water cylinder at home, or the local swimming pool.
- Have your students complete some measuring activities that involve predictions. Provide measuring jugs or measuring cylinders marked in litres and parts of a litre (millilitres), a source of water, and a range of containers. The students can estimate, in litres and millilitres, how much water is in each container if it is full, record their prediction and then measure and record how much water is in the container.

Water droplets on flax

- Ask your students if their predictions got better (more accurate) after they had tried a few examples and discuss how we make better predictions when we have more knowledge or experience.
- Give groups of students two buckets, one a quarter full of water and the other half or three quarters full of water. Ask them to predict what the buckets might weigh and then weigh them.
- Explain that in many countries children of their age have to carry water home from a local water supply. They may have to carry the water for up to a kilometre.
- Ask your students to experiment and decide what weight of water in a bucket they would be able to carry over a long distance.

Big ideas

Water and other liquids are measured in litres.

Water and other liquids have no shape, they assume the shape of the container they are put in.

Water has weight and the more water you put in a container the heavier the container becomes.

An Olympic sized swimming pool contains 2,500,000 litres of watert.

A bath contains 80 to 200 litres of water depending on the size of the tub,

Hot water cylinders usually hold 80 to 120 litres of water.

Water as a solid, liquid and a gas, evaporation and condensation

This is an experiment to explore what happens when water is heated. Students may have seen this before but it is a very good way to introduce or revisit the concepts of evaporation and condensation

Equipment:

- electric frypan or wok with a glass lid or a pot with a glass lid;
- if your frypan or pot does not have a glass lid, use a metal tray, mirror or similar item that has been in the freezer;
- water; and
- ice cubes.

- With a small group of students, put putting a small amount of water with ice cubes into your slow cooker or frypan with the lid left off. Ask your students to predict what will happen and the order of the events, e.g. ice will melt, water will heat up, water will turn into steam, the water in the frypan will disappear.
- Heat the water and discuss the terms of solid, liquid, gas, ice, water and steam.
- Boil the water until there is no water left and ask where the water went. Introduce the concept that when water is heated it evaporates or turns into steam. Steam is small water droplets in the air.
- Repeat the process but this time put the clear lid on the slow cooker or electric frypan. Observe the water droplets forming on the inside of the lid. If you do not have a clear lid hold a metal tray, mirror or similar item that has been in the freezer over the water vapour and observe the water droplets forming. (Do this safely to avoid a steam burn.)
- Discuss the idea that water can change from a gas into a liquid as it gets colder. This is called condensation.

Condensation forming on the lid of the frypan

Big ideas

Water can be a solid (ice), a liquid (water), or a gas (steam).

Steam is small water droplets in the air.

Evaporation is when water is heated up and turns into steam or water vapour.

Condensation is when steam or water vapour cools down and turns into water.

vocabulary

liquid
gas
steam
water droplet
water vapour
evaporate

kupu

wai	liquid
korohū	gas
mamaoa	steam
pata wai	water droplet
tākohu	water vapour
whakaeto	evaporate

Water is precious — we need water

Exploring evaporation

Equipment: (per group)

- two saucers or petri dishes;
- measuring teaspoons;
- thermometer;
- ice cream containers;
- heating devices such as a heater, lamp, slow cooker or electric frypan;
- watches or other timers; and
- ice cubes.

- Explain to your students they are going to set up two saucers or petri dishes with five teaspoons of water in them. Their challenge is to see which group can:
  - make the water in their saucer or petri dish evaporate fastest; and
  - make the water in their saucer or petri dish evaporate slowest.
- Set up a control for the class where you put a saucer or petri dish with five teaspoons of water in it in a safe place and leave it to evaporate. Record how long it takes to evaporate.
- Assist each group to set up their experiments, making sure heat and hot water are used safely. Ask the students to monitor the experiments through the day and replace ice and heat as required to.
- Use the options suggested by the students to explore water as a solid and a liquid and how evaporation works.

Big ideas

When water evaporates, liquid water turns into water vapour (gas) and enters the atmosphere.

Water evaporates as it warms up.

The hotter water is, the faster it evaporates.

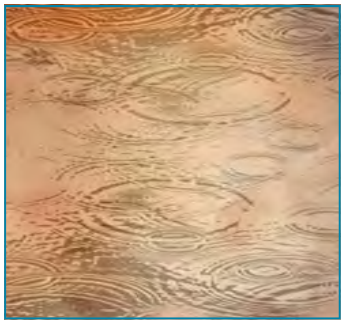
Water evaporates but it also absorbed into ground.

This water is available for plants to take in through their roots.

Disappearing puddles

Equipment:

- one litre containers of water;
- string; and
- outside areas like netball court and garden.



- Pour one litre of water onto a sunny area of concrete and another onto an area of garden and use string to outline the boundaries of the puddles. Monitor the puddles and watch as the water disappears.
- Discuss how heat causes evaporation but in the garden some of the water goes into the soil so the water in the garden disappears faster. This waters the garden so plants absorb the water through their roots.

vocabulary

liquid
evaporate
solid
liquid
gas

Water is precious — we need water

Rain, hail and snow – precipitation

Equipment:

- photographs of rain, hail and snow

- Choose a wet day to explore the role of clouds in causing rain to fall. Ask if anything special is happening today. Say that a scientific process called precipitation is happening and see if the students can work out what precipitation is.
- Explain the water that makes the rain is held in the clouds. When the clouds fill up with water they become so heavy with the water they burst open and rain falls from the sky.
- Ask :
  - if water can fall from the clouds as a solid;
  - what types of solid water can fall from the clouds (*snow, hail*);
  - what conditions you need for water to fall as a solid; and
  - what happens to the hail and snow after it reaches the ground.

- Ask your students to describe what it is like to be in the rain, or hail or snow. If you have photographs of a local hail storm or of snow falling in your area, discuss them with your students.

- Have your students write an illustrated poem or story about a rain, hail or snow storm or what it was like for them, their friends or family or a family pet to be out in it.

Big ideas

When it rains, hails or snows water falls out of the sky onto the land.

This is called precipitation.

vocabulary

rain
hail
snow
puddle
precipitation

kupu

ua	rain
ua kōhatu	hail
huka	snow
whakaeto	evaporate
whakauruhi	precipitate

Rain, hail and snow – precipitation

An ice flower

A North Island skifield

Frozen grass

Ice in a stream

How much rain is falling?

In this activity students can use a handmade or commercial rain gauge to measure the rainfall over a specified time.

Equipment:

- made or commercial rain gauge; and
- access to local weather information if required.

Kapanui School's permanent rain gauge

- Explain to your students that you are going to record the amount of rain that falls in a week (or other suitable timeframe) and decide with them if they are going to collect other weather details. Make or gather rain gauges.
- Work out with your students what weather information you will collect and where you will get the information, e.g. observation, newspaper, internet.
- Walk around the school grounds with your students and select suitable places to set up the rain gauges. Discuss what makes places suitable and not suitable, e.g. out in the open, not near a tree that could drop extra water into it, not near a building that might shelter the rain gauge from the rain, or not where students can knock the rain gauge over.
- Set up the rain gauges, making sure the gauges are firmly set into the ground so they will not be blown or knocked over.
- Record your weather observations and rain gauge recordings and discuss them and display them. You may choose to make a suitable bar or line graph of the rain gauge records.
- Discuss with your students who might be interested in knowing about local weekly and annual rainfall statistics.
- If your school collects rainwater, discuss how the water is gathered, collected and stored and what you use the water for. Find out who collects rainwater at home and how they use it.
- Explain why we usually do not drink rainwater unless it has been specially treated so it is healthy to drink. (*It make have picked up paint particles, dirt or things that make us sick as it goes across the roof, down the pipes or into the tank and drinking it could make us ill*).

Big ideas

We can measure rain fall using a rain gauge.

Making a rain gauge

Equipment:

- a large plastic soft drink bottle
- a ruler
- a marker pen,
- a craft knife

- Cut the top of a plastic soft-drink bottle and fit it up-side down into the rest of the bottle to form a funnel.
- Use a ruler and marker pen that will write on plas-tic to mark off a scale on the side of the water bottle every 10 mm.

Water is precious — we need water

How water freezes

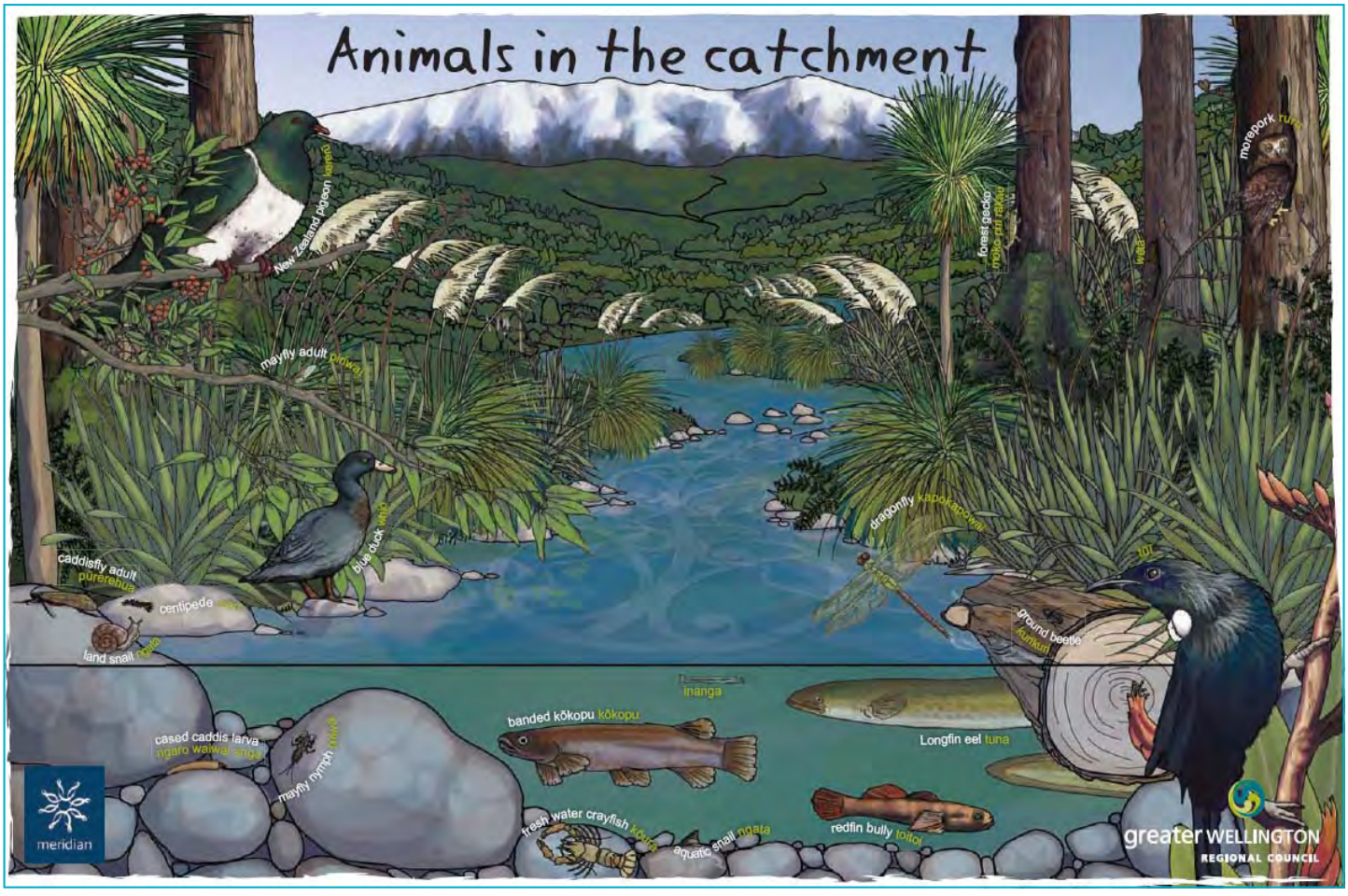
- Have your students partially fill some containers that can go into a freezer with water and observe what happens as the water in the containers freezes. Discuss the process of freezing or turning liquid water into solid ice and how the ice forms.

  The scientific reason is that the solid ice particles are lighter or less dense that the liquid water particles (or molecules) so the ice particles rise and float to the top of the liquid.
- Ask your students if they can think of one situation involving animals and aquatic plants where it is important that ice freezes from the top down.
- Use this illustration of life in a river to discuss this and to discuss some of the plants and animals in a local freshwater catchment area or river.

Big ideas

Ice freezes from the surface down.

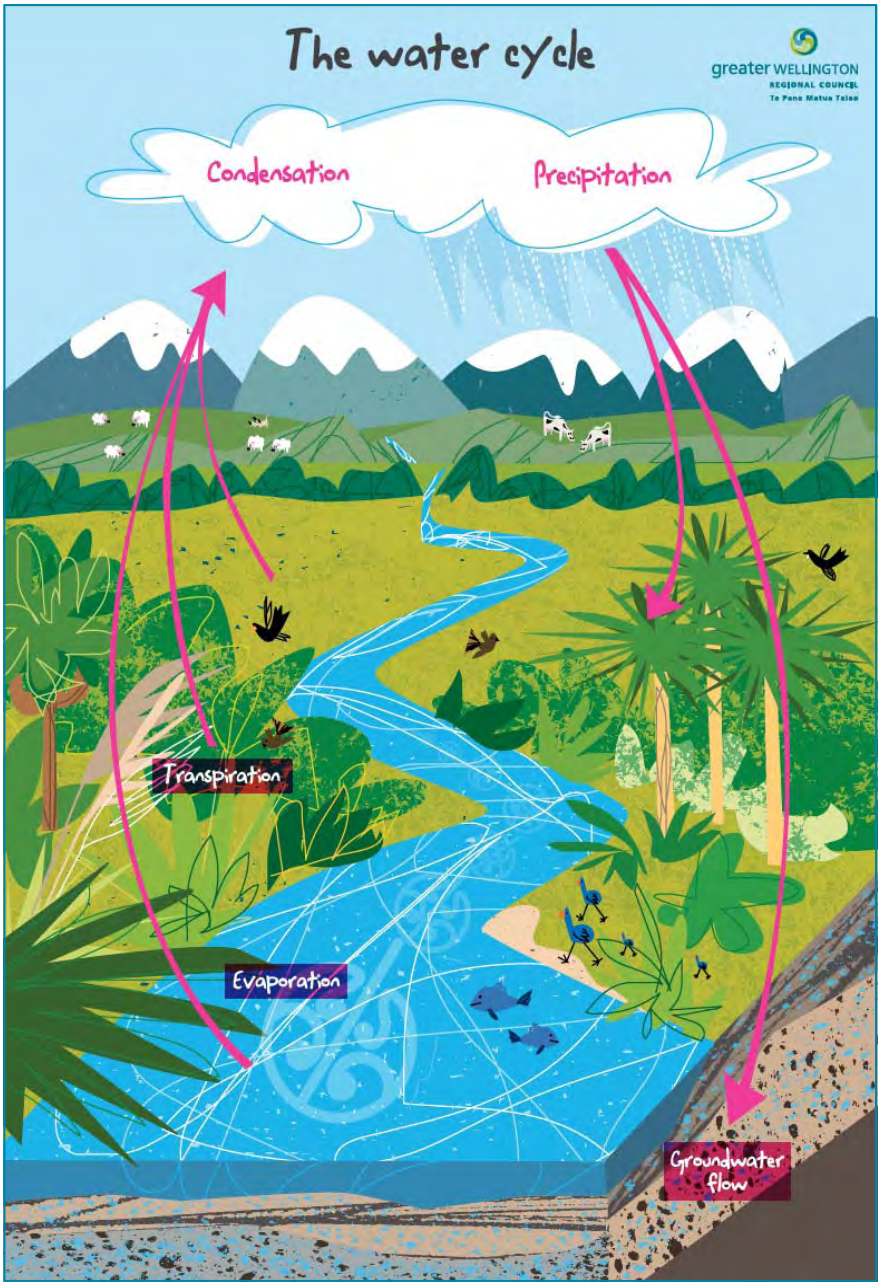
This means that a pond, river or lake will freeze on the top and the animals can live in the water underneath.



The water cycle

These activities provide an introduction to the water cycle.

Use this illustration and the explanation that follows on the next page to explain the water cycle to your students.



Big ideas

Water is cycled around the earth in a water cycle.

No new water can be created.

vocabulary

water cycle
evaporation
condensation
precipitation
transpiration

kupu

mataora wai water cycle
wai water
awa river
roto lake
moana sea

Water is precious — we need water

The natural water cycle

In cold weather water falls out of the clouds as rain, hail or snow.

Plants, animals and people use some of the rainwater. Some of the rainwater flows into the creeks and then into our rivers. The water flows into lakes or into the ocean.

Some of the water soaks into the earth creating groundwater.

The sun heats up water in rivers, lakes or the ocean and turns it into vapour or steam. The water vapour or steam leaves the river, lake or ocean and goes into the air.

When it gets cold, water vapour in the air gets cold and changes back into liquid, forming clouds. When so much water is stored in the clouds and they cannot hold it any more, the water falls back to earth as rain, hail, sleet or snow.

This means that water is constantly cycled around the earth.

Other resources

You Tube has some animated songs about the water cycle you can use to explain the water cycle.

Fiction and nonfiction reading material about the water cycle is available from Kāpiti libraries.

Make your own water cycle

- Have your students create a terrarium as in the picture.
- Put the jar in a sunny place and see how the water cycle works.
- Discuss what is happening with your students these terms:
  - ◊ plants need water to live;
  - ◊ plants get water from the soil through their roots;
  - ◊ water falls from the atmosphere or air onto the soil;
  - ◊ when it is sunny, water evaporates or returns to the air;
  - ◊ when it is cold, water falls as water droplets onto the soil; and
  - ◊ the plants are able to live for a long time because the water is going around in a cycle.

Adventures of a raindrop — a creative writing activity

- Have your students imagine some adventures for a raindrop. Build the stories up on a whiteboard, starting with the raindrop falling as rain and landing somewhere special.

  As background, your students may want to discuss how water gets into our body by drinking water, drinking other liquids like milk that have water in them and by eating food (as all food contains water). Humans and other animals lose water by breathing out, going to the toilet and by sweating, sneezing and crying.

  You may want to use these raindrop journeys as starter ideas.

  - ◊ **A raindrop falls out of the cloud and lands on a dog.**
  - ◊ **It falls to the ground when the dog shakes itself dry.**
  - ◊ **The raindrop joins other raindrops and makes a puddle.**
  - ◊ **The puddle gets bigger as more raindrops join it and it flows into a stormwater drain that flows into a stream.**
  - ◊ **A cow drinks from the stream and the raindrop goes into its mouth, and into its intestines and then to its brain.**
  - ◊ **The raindrop spends some time in the cow's brain before it comes out of the cow's body as urine.**
  - ◊ **The raindrop evaporates out of the urine into the sky and becomes part of a cloud waiting to have another journey around the water cycle.**

  - ◊ **A raindrop falls to the ground in a large rainstorm.**
  - ◊ **It lands on a car, then slides down the car into a puddle.**
  - ◊ **The puddle grows as other raindrops join it and the puddle flows into the garden.**
  - ◊ **The raindrop stays in the earth for a while before it is absorbed by a carrot plant through its roots.**
  - ◊ **The water stays in the carrot until the carrot is eaten by a boy skateboarder.**
  - ◊ **The raindrop enters the boy's bloodstream and is sweated out of his body as he tries to perfect a jump at the local skateboard park on a very hot day.**
  - ◊ **The raindrop lies for a short time on the footpath but as it is a very hot day it evaporates quickly and is back in a cloud waiting for its next journey.**

- Have your students work individually or in groups to write and illustrate the journey of a raindrop as it moves around the water cycle.

Water is precious — we need water

From the mountains to the sea

Use one or more of your walls to illustrate the journey of a water droplet starting in the clouds, falling onto plants on a mountain or hill, being washed down a stream or river and out to the sea.

What can happen to water on its journey from the mountains to the sea?

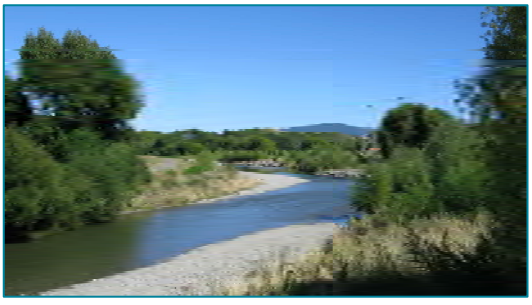
Use this activity to introduce the idea that the actions of people can change the quality of the water in our streams and rivers. We can pollute or harm the water by putting substances into the water.

Equipment

- one large clear glass or plastic container like a small fish tank filled with 10 to 20 litres of water; and
- 12 small containers containing:

Land use	Substance	Quantity
Forest	**Tea, mulch**	**1/2 container of tea and a teaspoon of mulch**
Farming	**Soil**	**1 teaspoon**
Orchard	**Baking powder**	**1/2 teaspoon**
Grazing	**Muddy water**	**1/2 container**
Lifestyle block - sewage	**Yellow water and toilet paper**	**Full container of water and small amount of paper**
Fishing	**Tangle of line**	**Piece of fishing line**
Water skiing	**Vegetable oil**	**1/2 teaspoon**
Picnic	**Styrofoam, plastic, pieces of balloon, other paper rubbish**	**Small pieces broken up**
Subdivision	**Soil**	**1 teaspoon**
Paint	**Acrylic paint**	**2 teaspoons**
Roads	**Coffee grounds**	**1/2 teaspoon**
Industry	**Detergent**	**A couple of drops of water in a full container of water and shaken**

Use this outline of a water droplet in your students' art work.



Water is precious — we need water

- Read this story to your students and at each highlighted word have a student come and open their container and empty it into the large container of water.
- This is not the story of a local river but it could be if people living near the river and those using the river for recreation did not act responsibly. Discuss who could pollute or put harmful substances into a local river.

From the mountains to the sea

Water droplets in the clouds fall to the earth as rain. The rain lands on trees and ferns and then fall to the ground. Lots of rain droplets form a small stream. The stream runs through a *forest.* The water flows downhill and washes some mulch and some soil into the river.

The river runs through some *farms.* One farmer has ploughed their paddock and recent rain has carried soil from the paddock to the river.

On a nearby *orchard* an orchardist has used fertiliser to encourage plant growth, but applied more fertiliser than the crop could use. They have sprayed their crop with pesticides to stop weed growth and prevent bugs destroying the fruit. When it rains, excess fertiliser and pesticides from the ground in the orchard are washed into the river.

A farmer *grazes* cattle on the river bank and they drink water from the river, and drop urine and wastes into the water. They disturb the soil on the river bank, and when heavy rains come the banks erode or collapse into the river.

Just outside town there are a number of small lifestyle farms. They use septic tanks.

Some people do not look after their septic tank systems. They let them overflow and let untreated sewage seep into the river.

A number of people have fun on or in the river. Someone *fishing* on the river bank lets their line get tangled around a rock and it breaks, leaving a length of line in the river. Other people are *waterskiing*. Their boat engine leaks soil directly into the river.

A family and their friends celebrate a birthday with a *picnic* by the river. A gust of wind blows some of their picnic rubbish into the water.

The river flows through the town. A new *subdivision* is being developed. Many of the trees have been removed. Although the developers have built areas to contain the soil on the subdivision site, in a big storm, soil is washed down the hill and into existing stormwater drains and then into the river.

People are *painting* their houses and wash their brushes and paint trays under the outside tap. Water goes into the stormwater drains and then into the river.

People who have spent the day at work drives home and the roads are very busy. *Oil* drips out of cars and when cars brake in a hurry, they leave traces of rubber on the road. Every time it rains the oil and rubber are washed into the stormwater drains and then into the river.

An industry uses *detergents* to keep its machinery clean. Sometimes the system to send dirty water to the wastewater treatment plant is overloaded and dirty water goes into the gutter and the stormwater drain. Some of the chemicals in the detergent cause increased growth of algae in the river. When the algae dies and rots it uses up the oxygen animals in the water need to live.

The river finally arrives at the river mouth. The river water carries many substances with it on its journey from the mountains to the sea.

Section 3: We need water to live

In this section students explore the idea that all animals and plants need water to live.

Big ideas

Water enters our bodies when we drink water, or drink other liquids like milk or fruit juice that have a lot of water in them and when we eat.

All food contains water.

Water leaves our bodies when we breathe out, go to the toilet, sweat, cry or sneeze.

Animals, including people, need water

Equipment: per group

- drawing paper;
- magazine pictures; and
- crayons, felt tips or paint.

- Give each group of students a large piece of paper. Ask them to select a picture of a land animal from a magazine (or draw a picture of the land animal) and place the picture in the centre of the page. Encourage one group to use a child or adult as their animal.
- Get the students to write these questions in four quarters of their piece of paper and then brainstorm answers to the questions:
  - How much of this animal is water?
  - How does this animal take water into its body?
  - How does this animal lose water from its body?
  - What does this animal use water for?

Animals and humans take water into their body when they:

- drink water;
- drink other liquids like milk or fruit juice that have a lot of water in them; and
- eat food, as all food contains water.

Here are some figures that you can use to give an idea of how much water each food contains:

Lettuce is 96 % water	Apple is 85% water	Banana is 76% water
Pineapple is 80% water	Milk is 87% water	Broccoli is 91% water
Chicken is 75% water	Ham is 54% water	

Animals and humans lose water from their body when they:

- breathe out;
- go to the toilet;
- sweat;
- cry and sneeze

Water is precious — we need water

People and animals use water:

- ◊ to drink
- ◊ to wash ourselves and keep us healthy
- ◊ to clean things
- ◊ to have fun with or in.

People also use water:

- ◊ to grow plants for food
- ◊ to put out fires
- ◊ to cook things
- ◊ to appreciate or value.

- Discuss why we make sure pets have clean drinking water or clean water to live in, and what would happen if an animal could not get water to drink for over a week.
- Make sure your students understand that they and other animals need to drink water every day to be healthy.
- You could extend this unit by exploring the plants and animals that live in a specific water environment, e.g. aquarium, or pond, rock pool or ocean.

Big ideas

Water is essential to plant and animal life.

The human body is 70% water and water makes up more than half our body weight.

Water is the main component of each of our 100 billion body cells.

We cannot last for more than four to six days without drinking water or obtaining water from food.

How much of me is water?

Ask the students how much water they have in them. Starting at their toes, would the water come up to their ankles, their knees, their hips, their armpits, their eyes or right over their head?

The answer is 70% of us is water and that would be up to our armpits.

Water is precious — we need water

Plants need water to grow

Equipment:

- suitable containers;
- potting mix;
- radish seeds or plant seedlings; and
- water.

- Have your students complete this experiment and then assist them to write it up using this structure.
  - **The aim of the experiment** (what they wanted to test);
  - **The method** (what they did — this may involve a diagram);
  - **The results** (what happened — this may involve a diagram); and
  - **A conclusion** (what the experiment proved).
- Explain the experiment explores how plants need water to grow. Get the students to set up a duplicate set of containers. Each set of containers will have the same soil and with the same sort of seed or seedling planted in them.
- The experiment questions whether plants need water to grow or seeds need water to germinate. Explain that all things will be the same except the one thing you want to test, water.
- Work out which containers will be watered and which will be kept dry and set up a regular watering pattern. Observe the containers for up to 10 days with students drawing what is happening on selected days.
- Discuss what has happened after 10 days and get your students to write up the experiment.
- If your school has a school garden, use this to demonstrate and discuss growing things we eat and how we make sure growing plants get water, especially in the summer. You can talk about mulching and how to water effectively. Gardening to save water is a feature of the Year 5 and 6 *Water is precious* programme.
- Explain that plants absorb water they need from the ground through their roots. Use reading books to demonstrate the growing cycle.

Big ideas

Plants need water to grow.

Plants can have too much water and die.

Plants take in water through their roots and lose water through their leaves.

You could extend this experiment by:

- considering if plants can have too much water. Some students will know that different plants require different amounts of water for ideal growth;
- adding compost to soil. Some students will know compost improves the ability of soil to retain moisture; and
- see if the same plants will grow in salt water.

Water is precious — we need water

Does everyone have enough water?

In this section of work students consider the effect of a shortage of clean water on young people in different parts of the world. It is intended that this is a major focus of this learning programme.

The work is based around a resource developed by World Vision New Zealand *Just add water* that focuses primarily on the Social Studies curriculum.

Your school can borrow:

- a copy of the *Just add water resource;*
- an accompanying DVD *Water for All ; and*
- the poster Everyone Everywhere Needs Water

from the Water Education Facilitator.

However you may wish to purchase these resources from World Vision New Zealand www.worldvision.org.nz. The activities in this resource explore how different places influence people's views and use of water. The main comparison is between New Zealand and a village in Niger that relies on well water.

World Vision has a section of their website your students can use online http://watermatters.worldvision.org.nz. This features the same family as in the *Just Add Water* resource.

The Water Matters site was created in 2007 as New Zealand young people visited Niger. While it is no longer interactive the website has photographs and activities that will engage your students.

A starter activity is provided on the next page.

Big ideas

There is a shortage of good quality water in some countries around the world.

People in these countries use 10 litres of water a day but New Zealanders use 740 litres per person per day.

Water is precious — we need water

How have we used water today and where did it come from?

Equipment:

- large sheets of paper;
- felt pens; and
- a full water bottle to use as a talking stick.

- Ask your students to think about all the things they have done today.
- Hand the water bottle to each student who is ready to give an answer and build a list of ways water has been used on a large sheet of paper.
- Discuss where the water came from and compete the activity *Safe Drinking Water* on the next page.
- Discuss groundwater by explaining how bore draw water up moving slowly through the ground below. Use the diagram on page 33 to show the different groundwater layers. Show that most home bores are shallow (less than 10 metres deeo). The Council uses deeper bores that supply water to Paekākāriki, Ōtaki and can supply water to the Waikanae Water Treatment Plant if the water level in the Waikanae River is low.
- Some students in the class may have bores providing water for their gardens. Some students may have rainwater tanks that supply water for irrigation, use in the garden and in some cases for drinking. The Ministry of Health recommends that rainwater is not used for drinking without treatment to remove any possible disease-causing organisms.
- Display the information your students provided on the wall for comparison as you consider water supply and use in Niger and other countries.

Big ideas

Most people on the Kāpiti Coast use treated water that is piped to their houses.

Some people collect rainwater in rain tanks.

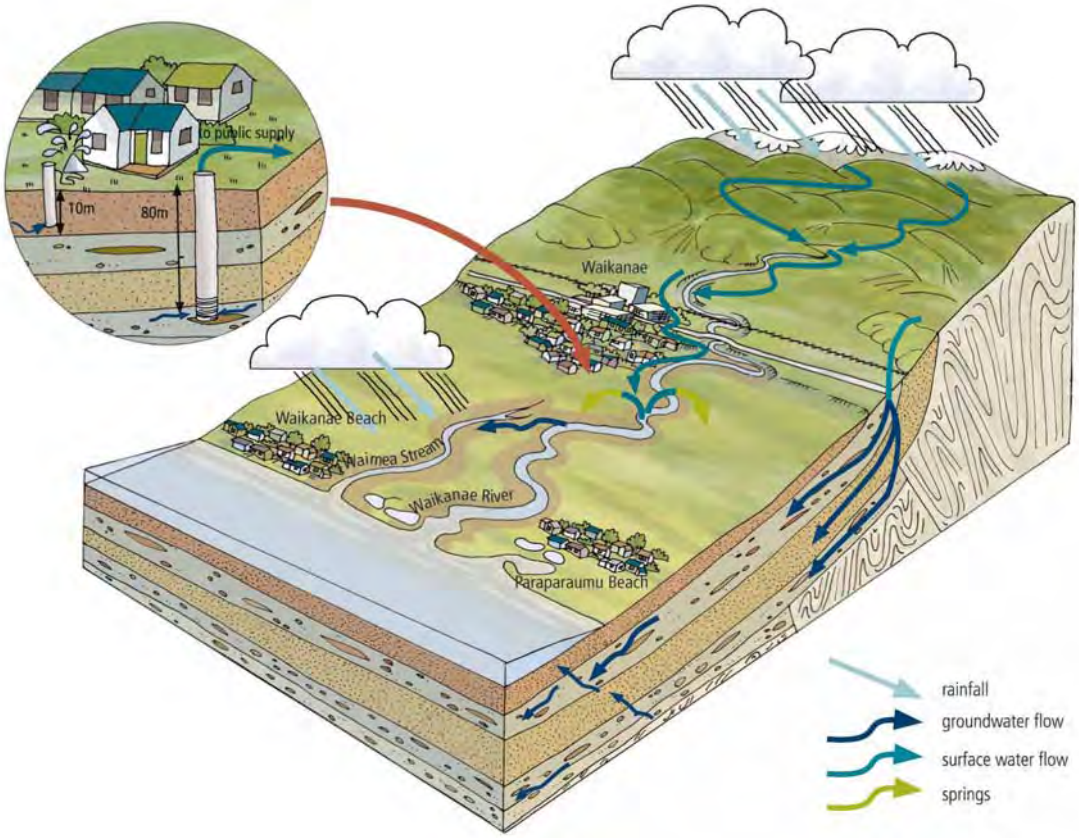
Other people have bores that use water from the water table or deeper groundwater.

The Council treats water from rivers and from underground to provide the water that comes from our taps.

A home bore

Rainwater tanks at an orchard

Tapping into the groundwater



Many Kapiti Coast gardeners rely on shallow groundwater from bores, especially over the summer months. Shallow groundwater is found in river and coastal soils up to about ten metres below the Kapiti Coast dunes.

The water gets into the ground from rain seeping into the soil, and also moves out of the Waikanae River bed, and into the groundwater system. Greater Wellington monitors and manages this resource so that it will remain a viable supply into the future, and so that wetlands and streams are not harmed by over-extraction.

This diagram shows the Waikanae River. Much of the water that moves out of the bed of the river re-emerges as springs that feed Waimeha Stream.

Groundwater is also extracted from deep aquifers. Kapiti Coast District Council has several bores into a deep aquifer for the public water supply. The inset diagram shows the different depths of shallow and deep groundwater bores.

Section 4: Three waters – drinking water, stormwater and wastewater

In this section students explore drinking water, stormwater and wastewater.

Safe drinking water

Equipment:

- four glasses of water; and
- small samples of soil, paint, cooking oil and detergent

- Create four glasses of dirty water by putting soil, paint, cooking oil and detergent in separate glasses of water. Discuss with your students if it would be safe to drink the water and consider how the substances could get into water or a water supply.
- Explain that it is safe for us to drink water out of the tap because water on the Kāpiti Coast has been treated to make sure it will not harm us or make us sick.
- If we drink water from rivers or streams or some rainwater the water may contain disease-causing organisms like Giardia that can make us sick. If your school collects rainwater for the garden explain why you do not drink the water.
- Check how many students bring a drink bottle of water to school. You could make a bar graph of the results, and discuss the capacity of the drink bottles e.g. how many millilitres (mls) of water they hold.
- Discuss why it is not a good idea to share your drink bottle with a friend.

  If you have a germ that could be making you get a cold or the flu you could pass it on to your friend when they drink from your water bottle.
- Discuss if anyone on the Kāpiti Coast needs to buy bottled water. This could include keeping a supply of water to drink and use in an emergency, like an earthquake, but should emphasise that when we have available tap water we do not need to buy and drink bottled water.

Big ideas

Water from the tap has been treated to make it safe to drink.

Not all water is safe to drink.

We could get sick if we drink water from toilets and basins.

We should not share our water bottles because sharing water can spread germs (disease-causing organisms) that can make us sick.

Water is precious — we need water

Where does our water come from?

Equipment:

- illustration *Our water supply*

- If you have a water supply in your classroom turn on the tap and fill up a glass of water and ask your students where they think the water comes from.
- Use the diagram on the next page and one of the explanations below to demonstrate where the water you drink comes from.

Rain falls on the land in an area called a catchment area. The water flows into streams and rivers. Some goes under the ground.

In Waikanae, we take water out of the river and treat it at the Waikanae Treatment Plant to make it safe to drink. The water is piped to reservoirs or large tanks where it is stored. Then the water is piped into our houses. We turn on the tap and drink safe water. This water supplies Waikanae, Paraparaumu and Raumati.

Some summers we need to use ground water as well as river water. We leave water in the river so that plants and animals can live there and people can use and enjoy the river. The river flows into the ocean.

In Paekākāriki the water we drink comes from a stream and from under the ground. It is treated before we drink it.

In Ōtaki the water comes from under the ground. It is treated before we drink it.

- Ask your students tod raw their house and cut up the illustration and draw their own pictures to create a water supply system that takes water from a river or a bore system to their house.
- Have your students create an illustrated story about themselves and their family using the water. Maybe someone caused a flood, or the dog did not want a bath or the cat likes a shower.
- Ask your students to cut out the illustrations and create a water supply system that takes water from a river or an underground system to their house.
- Have your students draw themselves and the family using the water, write suitable captions and display the pictures.

Big ideas

Water is treated at a water treatment plant so it is safe to drink.

Water is stored in large reservoirs on the tops of hills.

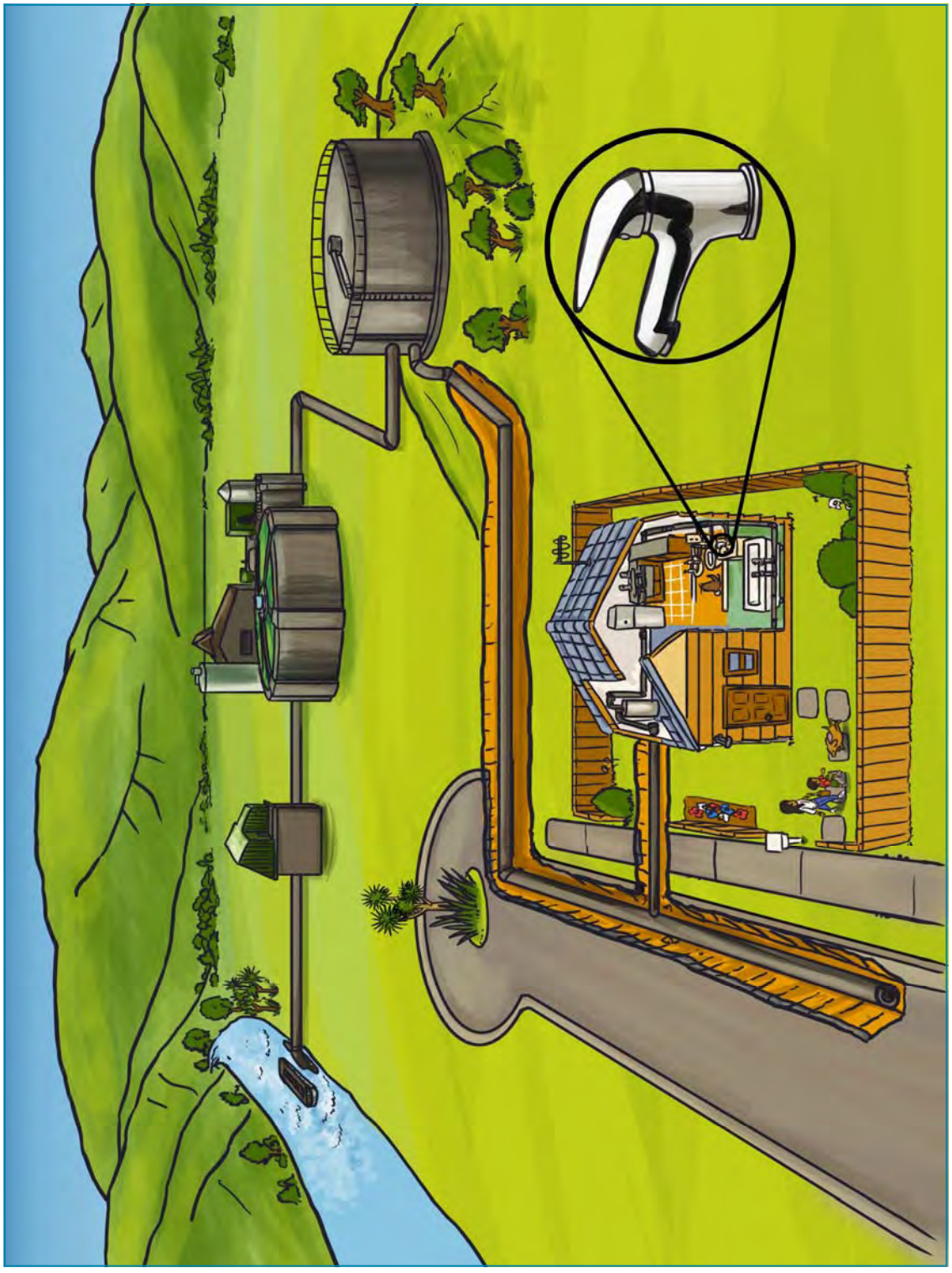
Water is piped into our homes.

Teacher information

Teachers may want to watch the 10 minute video clip *Our safe drinking water* at www.kapiti.coast.govt.nz to see how water is treated on the Kāpiti Coast.

The Waikanae Water Treatment Plant

Our water supply



Stormwater

What is stormwater?

- Explain that stormwater is water that falls to the ground in a big storm. Discuss what happens at your school when there is a lot of rain and identify the school's stormwater system of gutters and stormwater drains. Identify any areas where puddles occur or, in a big storm, areas where there can be flooding.

A dry stormwater drain with rubbish

- Ask the school caretaker to demonstrate how areas like the playing fields are set up so that water can drain away in a storm. Visit the school garden and see how it is set up to handle heavy rainfall.
- Go outside the school and identify how water flows down the street to the nearest stormwater drain.

Installing stormwater pipes under a new road

- Use the provided photograph to explain that when new roads are being built stormwater drains and pipes must be put in so that after a storm, water can be captured and returned to a waterway like a stream, river or the sea.

  The new stormwater system must be built to carry water as much as there could be in the biggest storm over 50 or 100 years.

  The Kāpiti Coast has over 8,000 stormwater pipelines that have a total length of more than 210km. There are over 3,300 manholes or places where Council workers can get into the pipes to fix them or clean them out or pump water in an emergency.
- Ask your students go home and identify their guttering system and stormwater drain. They can then make a drawing of the front of their home, guttering, downpipes, the stormwater drain and the journey of stormwater to a waterway. If a house is in a street without kerbing and channelling (no footpath) the house will not be connected to a stormwater system. Water from the house will go into soak pits then soak out into the soil.

Big ideas

Stormwater is water that falls to the ground in a big storm.

If too much rain falls in a storm then the land and our homes can get flooded.

We have stormwater systems (drains and pipes) to make sure that stormwater can be collected and returned to rivers, lakes and seas.

Stormwater returned to waterways is untreated water so it can be polluted with chemicals and be harmful to plants and animals.

We must not put things like paint, oil and detergent into the drain, otherwise we pollute the stormwater.

Keep stormwater clean

Equipment

- **paper and felt pens**

- Explain that stormwater drains release untreated water back to waterways such as like lakes, streams, rivers and the sea. If the stormwater is polluted and contains dirt, chemicals or disease, this can kill or harm the plants and animals that live there.
- Discuss these home scenarios with your students either referring back to your earlier demonstration about oil, paint, and detergent or repeating the demonstration.

Rubbish thrown in a stormwater lake

Mum or Dad or older brother and sister are washing the car and they use a lot of water from the hose. They let the soapy water flow into the stormwater drain. The water contains detergent but it also contains chemicals and small bits of metal that come from the car that can damage plants and animals.

Mum or Dad has been painting the outside of the house and they clean their paint tray and brushes under the outside tap. The painty water goes straight into the stormwater drain.

Mum or Dad has changed the oil in the car engine and they want to wash out the container they drained the oil into. It is oily they don't want to take it into the house and they wash it out under an outside tap. The oily water goes into the stormwater drain.

- Have your students make posters about why you should not put paint, oil or detergent down the stormwater drain and discuss them at home.

Big ideas

We can all make sure we do not put polluted water in the stormwater system.

Three stormwater pollutants — paint, soil and oil

Water is precious — we need water

An open drain moves stormwater when it rains

A wetland helps store and remove pollution from the stormwater before it enters rivers or the sea

A drain releasing stormwater into the sea

Dealing with floods

Ask if your students have been in a flood and display and discuss any photographs you have of your school or local area after a flood or heavy storm.

Photographs from the Paekākāriki flood of October 2003

Water is precious — we need water

Treating wastewater

- Ask your students:
  - ◊ what is taken away from their homes as wastewater;
  - ◊ why we need to wash our hands after going to the toilet;
  - ◊ what they think or know happens to the wastewater from their homes or your school; and
  - ◊ what must happen to the wastewater before it can be returned to the water cycle and why.
- Use the information here to check the students' answers. The Water Education Facilitator can provide you with more information about wastewater treatment, if required.

Wastewater from most homes is toilet waste and any water that goes down a plughole. In some homes some of the cleaner wastewater (greywater) is removed, recycled and used to water gardens (but not vegetables).

Wastewater from Waikanae, Paraparaumu and Raumati is treated at the Paraparaumu Wastewater Treatment Plant. Clean water is returned to a local waterway and makes its way to the sea.

Ōtaki wastewater and sewage is treated at the Ōtaki Wastewater Treatment Plant and the clean water is returned to the land. People in Paekākāriki and in rural areas use septic tanks.

- Discuss the value of recycling some household wastewater and have your students work out which wastewater would be safe to recycle.
- Discuss the term greywater and if it would be safe for your school to use greywater to water school gardens, then explain how this system works. Using untreated greywater for gardens is suitable for single households but not suitable if collecting water from community facilities such as schools. Community facilities wanting to reuse greywater need to install more comprehensive treatment systems to remove all microorganisms.

.

The Paraparaumu Wastewater Treatment Plant

Big ideas

Contact with ewage or toilet wastes can spread disease.

On the Kāpiti Coast most wastewater is treated.

The solids are removed and broken down and the clean water is returned into the water cycle.

Big ideas

Greywater is wastewater generated from domestic activities such as laundry, dishwashing, and bathing.

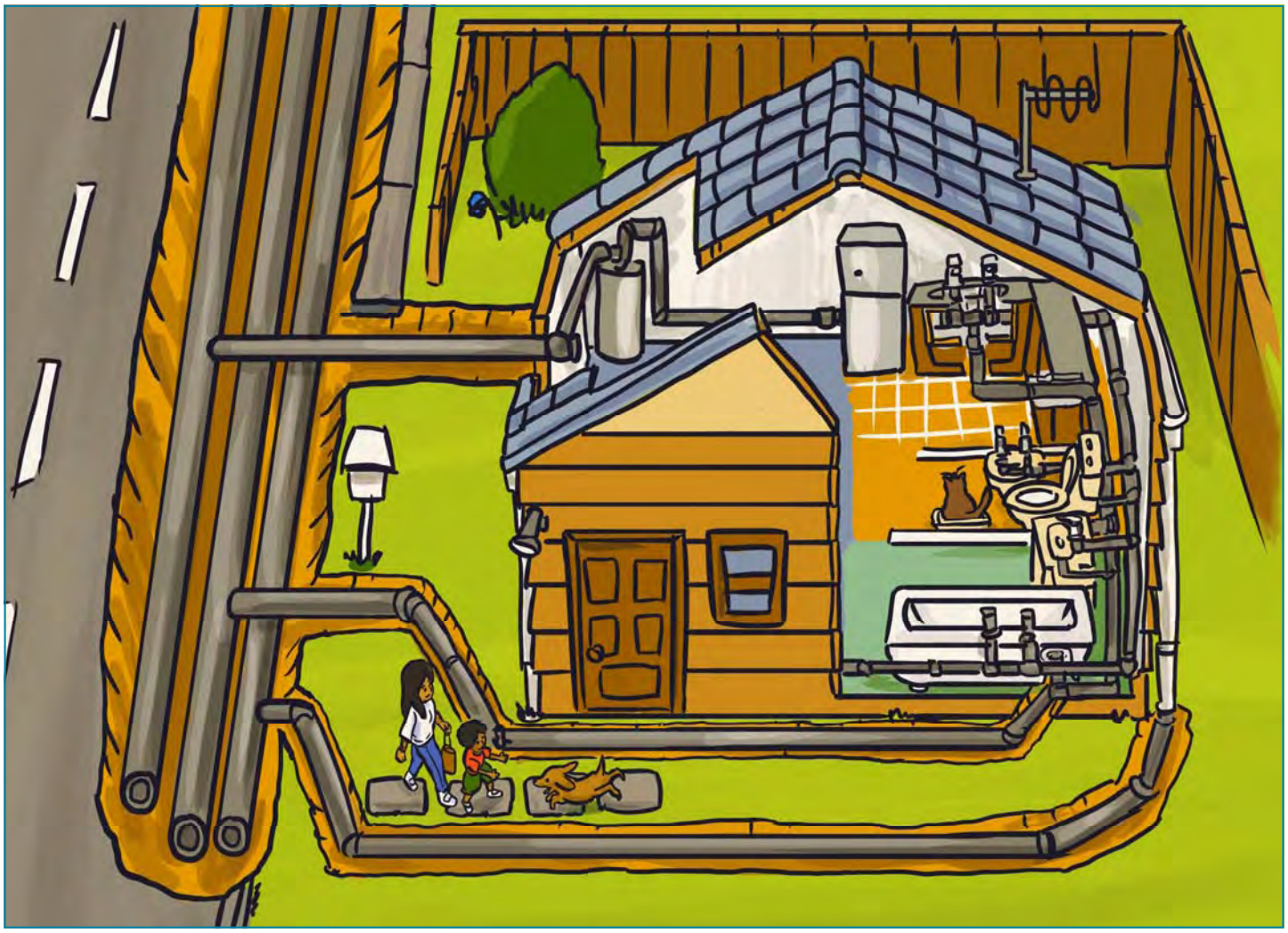
Greywater can be recycled and used to water gardens through irrigation that is below the ground.

Don't use greywater to water vegetables.

Greywater does not include toilet or kitchen waste water.

The water pipes that take water into and out of our house

- Work in pairs or small groups and identify what is carried in the three pipes shown in the picture.
- Write a caption for each pipe system that explains:
  - ◊ where the water has come from and where it is going to; and
  - ◊ any treatment the water receives.



Section 5: Being waterwise and conserving water

In this section your students explore ways to be more aware of the water they use and how to conserve water at home and at school.

Being waterwise and conserving water at school

- Take your class around the school and explore the ways your students and the school uses water. If you use, rainwater or bore water explain what you use this water for and why.
- Discuss the concept of being waterwise and conserving water. Take photographs of your students and/or school staff using water wisely and make a photograph display of how your school uses water.
- Ask the students to predict when in the year your school will use the most water and then identify what the school does that uses more water in terms 1 and term 4 (the summer months).
- Have your students identify up to 20 ways students and school staff could waste water if your school was not waterwise.
- Discuss what the school students and staff can do to be more water-wise and conserve more water especially in terms1 and 4.
- Have your students adopt some waterwise actions to make sure they do not waste water at school.

  These actions can include:
  - ◊ making sure they turn off the tap after they wash their hands;
  - ◊ reporting any taps left on or leaking taps; and
  - ◊ using the half–flush on toilets with dual flush.
- Have your students identify one way the school could save more water and work how they can work with school staff to take action and reduce the amount of water used.

Big ideas

We can change the way we use water at our school and be waterwise and conserve water.

We need to conserve or save water especially in the Summer, term 1 and term 4.

Suggestions to save water at school

Change the way students and staff use the water.

Students undertake a water audit with the Water Conservation Advisor

Use rainwater or borewater to water gardens or sports fields (greywater is not suitable for a school).

Grow plants that don't need a lot of water.

Fill up the staffroom dishwasher before turning it on.

Install taps that automatically shut off.

Install water efficient appliances.

Water is precious — we need water

Being waterwise at home

- Let your parents know that your students will be coming home and discussing ways the family can save water and send home the information sheet *Using water in the home.*
- Use the photographs on pages 10 to 13 to revise the ways we use water at home.
- Ask your students to take a journey around their homes and talk with their families about how they use water at home and what they do to be waterwise and save water.
- Discuss the ideas the students bring back to class and create an illustrated book with the title *We can save water at home.*
- Start the book a page that says: *We can save water when we …* Then create an illustrated page for each idea the students have.

  Organise the ideas in areas such as:
  - ◊ *In the kitchen;*
  - ◊ *In the bathroom;*
  - ◊ *In the laundry;*
  - ◊ *Outside — in the garden; and*
  - ◊ *Outside — not in the garden.*
- Get your students to take the finished book home and discuss it with their families. Suggest that each family adopt one new action or water-wise practice to save water this summer.
- Ask your students to focus on one action they can do every day to conserve water. It could be, for example, making sure they always turn the tap off, reducing the time they spend in the shower, or turning the tap off while they are brushing their teeth, or using the correct toilet flush.
- Have the students create a chart that explains what they will do and record whether the student carries out the action each day for a week.
- After the week, ask the students to take action to conserve water and then bring their completed charts back to class. Discuss how easy it will be for them to keep taking those actions every day for the next month, the next year or for the rest of their lives.

Big ideas

Being waterwise is taking actions to use water wisely or save water.

We can all be waterwise and conserve water.

We can save water at home and at school.

We can take action to conserve water in all areas of the home.

Drink water every day.

Make sure your students understand that they are not being waterwise if they stop drinking water.

We need to drink water to be healthy.

Water is precious — we need water

Using water in the home

Water use area	How much does the average home use?	What can we do to reduce our use?
	Garden hose hand held up to 900 litres per hour. Garden hose sprinkler up to 1,300 litres per hour Garden hose, uncontrolled up to 2,000 litres per hour.	• Water early morning or late at night to avoid evaporation. • Mulch your garden. • Avoid overwatering. • Use greywater and/or rainwater to water your garden. • Use a soaker hose.
	Shower at 6 litres per minute for 5 minutes uses 30 litres . Shower at 18 litres per minute for 5 minutes uses 90 litres.	• Take shorter showers. • Change your showerhead to one that produces a lower flow rate.
	A full load in a top loader uses 130 litres or more. A full load in a front loader uses approximately 50 to 70 litres.	• Wash with a full load or use economy settings for part loads. • Buy a washing machine with at least a four star WELS rating.
	The average single flush toilet uses 11 litres per full flush. Modern dual flushing toilets use only 3 to 6 litres per flush.	• Use the dual flush appropriately. • Install a dual flush toilet. • If you have a single flush toilet install a Council supplied lead weight to manage the flush.
	A tap that loses 2 drips per second can lose 380 litres per month send 15 to 30 litres of water down the drain every minute.	• Fix dripping taps. • Don't leave the tap running when you clean your teeth. • Don't leave the tap running to rinse the dishes or when you peel vegetables.
	A dishwasher uses approximately 28 to 40 litres per wash cycle. The kitchen sink holds 14 litres.	• Run the dishwasher with a full load of dishes. • Buy a dishwasher with an AAA water conservation rating. • Wash the dishes in a half full sink instead.
	A bath uses 80 to 200 litres of water depending on size.	• Consider showering instead of taking a bath. • Use less water in the bath.

Produced by Kāpiti Coast District Council.
www.kapiti.coast.govt.nz

Section 6: Taking action to use water wisely

In this section your students focus on what they and their families can do to be waterwise and conserve water.

Big ideas

We can all save water.

Every drop counts.

Using water wisely

Note: In this learning programme the actions to use water wisely or conserve water are the logical conclusion to the section 5 activities *Be waterwise and conserve water at school* and *Be waterwise at home.* Some unit conclusion activities that can be used as individual or group assessment activities are provide here.

- Have your students create a classroom mural that finishes the starter sentence:
  - ◊ I save water when I …
- Have your students create plays that complete these sentences:
  - ◊ Our family saves water when we …; and
  - ◊ Our school saves water when we …
- Chalk a trail wide enough for your students to walk in from your classroom to the school garden. Have your students write all the water words they know on the trail.
- Use a filled water bottle as a talking stick and have each student complete the sentence: *Water is precious to me because…* Have the students refer back to their ideas at the beginning of the unit and reflect on their learning journey.
- Show your parents and caregivers:
  - ◊ what your students have done as they have learnt about valuing and conserving water; and
  - ◊ what your school does to value and conserve water.
- If your families are interested, work with the Water Education Facilitator to hold a meeting at your school to find out how they can conserve water, make homes more energy efficient and reduce waste.