



Water is precious — water is life

Water is precious — water is life is a programme about water use and water conservation for use in Year 7 and 8 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 that 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 watered@kapiticoast.govt.nz 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 that focus 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 of water issues on the Coast and actions they and their families can take to use water wisely.

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 — water is life

Water is precious– water is life

Teachers' Guide

	Page
Introduction	1
Overview of the learning programme	3
Curriculum links	4
Modelling waterwise behaviour	5
Involving parents and carers	5
Provision of water services	6
Assistance from the Kāpiti Coast District Council Green Team	7
Resources to use in this programme	8

The learning programme

Section 1 Water is precious

Water is precious — he tāonga te wai	10
Exploring the cultural significance of water	13
Taking care of water and our waterways	15

Section 2: What is water?

Water – one of Earth's finite resources	16
The water cycle	17
From the mountains to the sea	18

Section 3: We need water to live

Plants and animals in our freshwater ecosystem	20
How do we use our water ?	21

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

Our safe drinking water	22
Water issues on the Kāpiti Coast	23
Having enough water now and into the future	24
Water use on the Kāpiti Coast	29

Section 5: Being waterwise and conserving water

Reducing our water use at home	30
Reducing our water use at school	34

Section 6: Taking Action to use water wisely

Investigating our local stream or other waterway	35
Life long learning about water	35



Water is precious — water is life

Overview of *Water is precious — water is life*

Water is precious — water is life is a programme about water for use in Year 7 and 8 classes at primary schools on the Kāpiti Coast. It is a cross-curricula learning programme that can meet level 1, 2, 3 and 4 Achievement Objectives in English, Science, Social Studies, Health and The Arts curricula.

This programme has a focus on investigating a stream or wetland near the school and this component is based around *Take Action for Water*, an on-line resource produced by the Greater Wellington Regional Council.

The learning programme is in six sections:

1. Water is precious

This section has students review what they know about water and why we value water. Students briefly explore the cultural significance of water for local iwi and begin an investigation into a local stream or other waterway e.g. lake or wetland.

2. What is water?

In this section, and others, students investigate the abundance of fresh water globally, nationally and on the Kāpiti Coast. Students investigate the water cycle and the impact of human activity in catchments.

3. We need water to live

In this section and in section 6 students investigate a stream or other waterway habitat, considering the quality of the water, the plants and animals that live there and the impacts people's activities have on that ecosystem. Students consider how water is used globally and calculate their water footprint.

4. Three waters – drinking water, stormwater and wastewater

An investigation of the provision of safe drinking water, and of water issues on the Kāpiti Coast.

5. Being waterwise and conserving water

An investigation of ways to use water wisely and not waste water at home and at school.

6. Taking action to conserve or value water

Students complete an investigation of a local stream or other waterway and may take action as a result of this investigation. They reflect on what they have learnt and how this will affect the way they value and use water throughout their lives.





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Curriculum links

Values highlighted in this unit	How students will be encouraged to develop the selected value or values during the unit
Respect Community Innovation, enquiry and curiosity Care Integrity	Students will be learning to respect, value and care for water as they investigate a local freshwater ecosystem e.g. a stream, lake or wetland. Students are encouraged to carry out investigations about water use in the local community, to use water safely and to conserve water as they carry out a range of activities.

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 Participating and contributing Relating to others Using Language, Symbols and texts	Students take responsibility for their own actions to use water wisely and conserve water, especially in the summer months. Students interpret statistical and other data to make meaning of water issues on the Coast, interview local residents and explore a range of points of view about water and water use on the Kāpiti Coast. Students may choose to take a range of actions after their research and practical investigations including their study of a local freshwater ecosystem, their audit of their home and school's water use.

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.



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Modelling water-wise 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 water-wise behaviour and valuing water
- what type and level of social 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 investigating water use 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
- encourage parents to become involved in water conservation projects your class or school undertakes
- invite parents to come to the school to see and hear about what the students have learnt
- attend a talk with speakers from the Kāpiti Coast District Council that describes ways to conserve water, use energy efficiently and minimise waste.





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Provision of water services

The Kāpiti Coast District Council is responsible for providing:

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

Kāpiti Coast residents pay for these services when they pay their rates.

Different water services are provided in different areas on the Coast.



The Waikanae Water Treatment Plant

Water issues on the Kāpiti Coast

Teachers are invited to read the *Water Issues on the Kāpiti Coast* on 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.

Support for teachers

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 wated@kapiticoast.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, The 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 co-operation 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.



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Assistance from the Kāpiti Coast District Council Green Team

Members of the Green Team can come to your centre and offer FREE advice about using resources sustainably.

The green team can work with your staff to:

- complete a review of how efficiently your centre uses water and practical ways to reduce water usage. (via the Water Conservation Adviser)
- complete an energy efficiency review and practical ways your centre to be more energy efficient, reduce heating costs and be warmer, drier and healthier (via the Eco-design Adviser)
- develop sustainable gardens (via the Green Gardener)
- become an enviroschool (via the EnviroSchools Facilitator)
- implement a water education programme (Water Education Facilitator)
- develop and implement a waste minimisation programme (Waste Minimisation Officer).

If you centre would like the services of the Green Team, the Water Education Facilitator can organise a visit or you can go to www.kapiticoast.govt.nz/greenservices to find out more.

Free services for families

Families can 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.

Families can also go to Council website (www.kapiticoast.govt.nz/greenservices)

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 a talk that provides tips on how to use water efficiently and conserve water, as well as advice on how to make homes warmer, drier and healthier.



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Journal stories and Connections

The river, water and the water cycle

Te pūpū harakeke

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

Counting koura

By B. Gore
CN, No. 1, 2007 1
pages 8 - 25

A closer look

Play by P Werry
SJ L2
Aug 2011

Awa

Poem by G O'Connell
SJ L2 Aug 2012

Animals

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)

The story of Rangi and Papa

by M. Roberts
SJ, Pt. 1, No. 5, 1994
Pages 18 – 23 (RA 8 – 9)

Te pūpū harakeke

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

Counting koura

By B. Gore
CN, No. 1, 2007 1
pages 8 - 25

Walking on water – the grass waterspider

by D. Noonan
SJ, Pt. 4, No. 3, 1994
pages 38 – 42 (RA 11-13)

Fish and fishing

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

Where my ancestors walked

by R. Ahipene - Mercer
SJ, Pt. 4, No. 2, 1990
pages 2 – 7 (RA 12 – 14)

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

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

Taking the bait

Article K Potter
CN No4 2012

Voyage of Discovery

E Chisholm
CN No4 2012

Weather

Hard ice, soft ice

by B. O'Brien
CN No. 2, 2004
pages 18 – 21

Rain

Poem by H Tuwhare
SJ L3 Feb 2012

What makes the weather

E Brenstrum
CN No 3 2012

A piece of paradise

L Thorpe
SJ L3 June 2012

The Evil drinking fountain

L Thorpe
SJ L3 Feb 2012

Making puddles

S Averil
CN 1 2000

Severe Weather

S Wilcox
SL No 1 2012



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Resources that support Water is precious -- water is life

These resources are referred to and intended to be used with this learning programme:

Turning on the Tap, a Greater Wellington Regional Council resource available on line at www.gw.govt.nz/turning-on-the-tap

Take Action for Water a Greater Wellington Regional Council resource available on line at www.gw.govt.nz/take-action-for-water

Up the Creek at www.biodiversity.govt.nz/kids

The Water Cycle: a Science Journey a resource that can be purchased from NCER at www.nzcer.org.nz

TKI Science Concepts Book 31: Water and Weather: The Water Cycle and the Atmosphere

H2O-On-the-Go, an online resource available at www.sciencelearn.org.nz/Contexts/H2O-On-the-Go

DVDs

Guardians of the Mauri and *Underwater under Threat: New Zealand's Freshwater Native Fish* available on loan from the Water Education Facilitator.

Our Safe Drinking Water

Your school has a copy of the DVD *Our Safe Drinking Water* produced for use in schools by the Kāpiti Coast District Council.

This DVD shows students visiting the Waikanae Water Treatment Plant.

If your school needs a replacement copy of the DVD contact the Water Education Facilitator.

The Outlook for Someday – the sustainability film challenge for young people

The Outlook for Someday sustainability film challenge is to make a short sustainability-related film. It can be any genre, filmed with any camera and any length up to 5 minutes. Anyone up to age 24 can enter, either individually or in a team.

Entrants are encouraged to interpret 'sustainability' in the way that makes sense to them. Previous year entries have been made by primary school students and some were focused on water.

Find out more about this competition by visiting the Outlook for Someday website www.theoutlookforsomeday.net. Your students can watch videos that are previous winners.

The Kāpiti libraries hold a number of fiction and non-fiction books about water and books can be borrowed from the National Library Curriculum Services.



Water is precious — water is life

Section 1: Water is precious

This section has students review their understanding of the concept that water is precious.

Water is precious - he tāonga te wai

Equipment

- A3 paper
- art materials
- computer access or copies of photographs

- Have your students work in groups and brainstorm their ideas under these headings :
 - ◇ *Water is precious – he tāonga te wai because...*
 - ◇ *We value and respect water when we ...*
 - ◇ *We disrespect water when we...*



- Have your groups share and discuss their responses.
- Explain that each student is to make a strong visual message to highlight valuing and respecting water. The image and words that are used are intended to catch the attention of the reader and have them pause and think.

Students could complete this image on the computer using the photographs provided here, their own photographs or artwork or other photographs of water from <http://bestdesignoptions.com/?p=11638>. Students can use any design package they are familiar with to add text.

Alternatively your students could use copies of the photographs provided and use paints or felt pens to create the images.

- Discuss with students the idea that if all images are displayed at once they may lose their impact and work out a way or ways to display all of the images the students have created in your classroom or elsewhere in the school to give them maximum impact. You could, for example, make some large cubes with a laminated image on each face and allow students to rotate the cubes to display different combinations of images.

Big ideas

Water is a precious resource.

Water is a finite resource – the earth has a limited amount of water.

Actions people take can affect the quality and quantity of water.

vocabulary

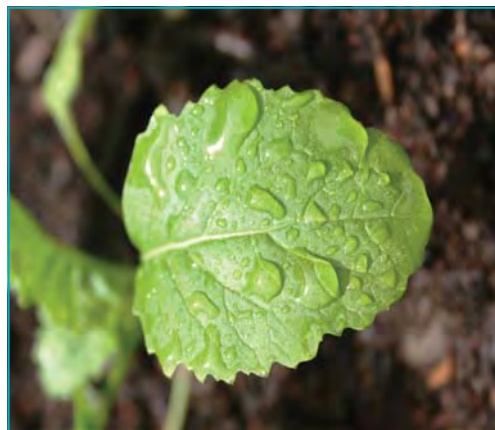
precious
treasure
river
lake
sea

kupu

tāonga	treasure
wai	water
awa	river
roto	lake
moana	sea



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Produced by Kāpiti Coast District Council.
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Exploring the cultural significance of water

Value of water to Māori

- Show your students the section of the DVD *Our safe drinking water* at 3 minutes 35 where Kāpiti Coast District Council kaumatua Koro Don Te Maipi discusses the Māori perspective on water.
- Have the Water Education Facilitator organise a representative from your local iwi to visit the local waterway your class is going to investigate and discuss the importance of local water environments to Māori and the concept of kaitiakitanga or guardianship of waterways.
- Have your students read the story of Ranginui and Papatūānuku and explain how, in the Māori world view, the water on earth was created and water is valued.

In a Māori world view, the Earth is a living entity.

Papatūānuku is both our ancestor and our provider. People are descended from her through the atua (Māori 'gods'). The atua are the environment and as descendants of the atua, people are part of the environment.

As water is part of that environment, we are water and water is us.

Tangaroa is the atua of the sea, rivers, lakes and all life within them. As part of this living system, water has its own mauri, energy, or life-force.

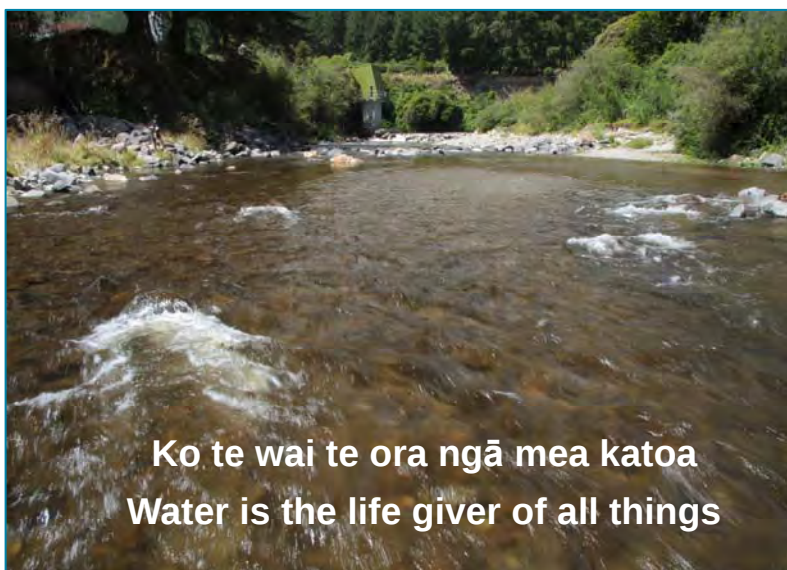
Big ideas

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.

kupu

kaitiaki	guardians
iwi	tribe
mauri	life force
atua	gods



Ko te wai te ora ngā mea katoa
Water is the life giver of all things





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Ranginui and Papatūānuku

In a Māori world view, life began with the separation of Ranginui (the sky father) and Papatūānuku (the earth mother). Here is their story.

In the beginning there was Te Korekore, the nothingness. All was dark and still. There was no light, no life, but there was potential for life. Slowly the darkness gave way to light and the first parents, Ranginui and Papatūānuku emerged.

Ranginui and Papatūānuku clung to each other in a strong, loving embrace. They created many children, the atua, who lived in the cramped, dimly lit space between them. The children were unhappy living in the dark and decided to separate their parents so they could live in light. They tried to separate their parents several times but their embrace was too strong. Tānemahuta had an idea. He lay down with his back against his mother Papatūānuku and pushed his feet up against his father Ranginui. With great strength he pushed against his parents until finally their embrace was broken.

The separation of Ranginui and Papatūānuku created the universe. Papatūānuku became our earth with its rugged mountains, deep valleys and flat plains. Ranginui became the sky, allowing Papatūānuku's body to be enveloped in light, warmth and air.

Ranginui and Papatūānuku were heartbroken about their separation and often cried as they looked at each other. Their tears covered much of the land and formed the sea. The children were concerned that the crying would flood the earth so they turned Papatūānuku on her side, making it difficult for the grieving parents to look at each other.

The children thrived in the new light filled world. Their mauri, their life force, developed and they brought new life into the world. Tānemahuta became atua of the forests and created the plants, birds and insects, while Tangaroa became atua of the water and created the fish and other animals that dwell there. Life flourished on Papatūānuku.

However, Tāwhirimātea, who disagreed with the separation of his parents, went to live with his father and became atua of wind and storms. To this day he is still angry with his brothers and shakes the forests of Tānemahuta with fierce storms, breaking branches and crashing trees to the ground. He whips up the seas with gales and casts some of Tangaroa's children on to the shore.

While the agony of the initial separation has eased, Papatūānuku and Ranginui still long for each other and often weep. Papatūānuku's tears bubble up from the earth in the form of fresh water springs and her sighs for Ranginui are seen as the soft mist that lingers over her valleys. Ranginui's tears fall as rain and they merge with the tears of Papatūānuku creating streams and rivers that flow to the sea. Where the mountain peaks seem to touch the sky, the separated parents are closest to each other. Being so close to his beloved, Ranginui sometimes cries and his tears create a veil of mist over the mountain peaks.

So it was, that water was created by the grief of the separated parents. Aotearoa became a land filled with fresh, clean waters that flowed from the rugged mountains to the sea. The streams, rivers and lakes contain their own mauri, their own life giving energy, essential for sustaining life on Papatūānuku.



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Taking care of water and our waterways

People from many cultures value, respect, treasure and care for water. On the Coast, many people take an active role in caring for marine and freshwater environments.

Students will experience taking a role as kaitiaki or guardians of a section of a waterway as they undertake their *Take action for water* study. Some students may decide to take a permanent role with conservation and restoration groups after they have completed this study.

- You probably will have decided which waterway you are going to investigate in your *Take action for water* study. In a number of situations, schools have developed partnerships where students work alongside established care groups or conservation groups caring for waterways near their school.
- If your school has a partnership with a conservation or stream restoration group explain to your students that you are going to do an investigation into the health of that stream and have your students prepare some questions for a representative of the group that focus on:
 - ◇ what the conservation or care group is doing at the stream
 - ◇ why this work is needed
 - ◇ what the stream looked like in the immediate and more distant past
 - ◇ what they would like to see the waterway look like in 25 years
 - ◇ what will ensure this vision is realised
 - ◇ what the threats are to the vision being realised and what can be done to make sure these threats do not occur or are minimised
 - ◇ how young people can help to conserve or restore the area.



- If your school has not decided on a section of a local waterway for their study, talk with the Water Education Facilitator who can discuss options with you and put you in touch with local conservation and restoration groups.



Big ideas

Many people in the community take a role in caring for our waterways.

kupu

tāonga	treasure
wai	water
awa	river
roto	lake
moana	sea
urupa	cemetery



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Section 2: What is water?

This section has students investigate water as a finite resource and increase their understanding of the water cycle.

Water — one of Earth's finite resources

A demonstration of the earth's water resources

A demonstration kit is available from the Water Education Facilitator.

- Gather a 20 litre water container filled with water, three mugs, a plastic cup, a salt water label and a teaspoon.
- Show the students the 20 litre container and have them imagine that it represents all the water in the world.
- Pour two mugs of water from the 20 litre container. The water left in the 20 litre container represents how much of the world's water is ocean and is salty water.
- The two mugs of water represent the world's fresh water.
- Pour half a mug of water into a third mug. Three quarters of the water (one and a half mugs) represents the water locked up in the Arctic and in Antarctica.
- From the half filled mug, take out three teaspoons of water and put it in a plastic cup.
- The water left in the mug represents the fresh water that is underground and can't be reached.
- The water in the plastic cup represents the less than one percent of the world's water that is fresh and can be easily reached in lakes, rivers and the soil by humans, plants and animals.



The earth from space – the blue planet

Big ideas

Water is a finite resource.



He nohonga ngātahi-tanga ahau me te taiāo

We live as one with our natural world

In 2011 our world population reached six billion. By 2025 the world population is expected to reach eight billion, yet the planet cannot produce more fresh water.



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The water cycle

If your school has been using the *Water is precious* learning programme your students will have already investigated the water cycle and extension ideas are provided here.

If your students are not familiar with the water cycle then use:

- the water cycle section of the Year 5 and 6 resource *Water is precious — every drop counts* and
- the water cycle section of *Take Action for water* the Greater Wellington Regional Council resource downloadable at www.gw.govt.nz/take-action-for-water.
- If your students are ready to extend their conceptual understanding of the water cycle :
 - ◇ purchase *The Water Cycle : a Science Journey* from NCER at www.nzcer.org.nz/
 - ◇ use material from H2O-On-the-Go, an online resource available at www.sciencelearn.org.nz/Contexts/H2O-On-the-Go. You will need to investigate this comprehensive website to determine how to use it with your students
 - ◇ use activities from *TKI Science Concepts Book 31: Water and Weather: The Water Cycle and the Atmosphere*.
- Have your students discuss the whakataukī below in the context of the water cycle.

Inumia, inumia, i ngā wai kaukau o o tūpuna

*Drink, drink of the bathing waters
of your ancestors*



*He taura whiri kotahi mai
anō te kopunga tai no i te
pu au*

*From the source to the
mouth of the sea all things
are joined together as one*



Big ideas

**Water is cycled
around the earth in a
water cycle.**

**No new water can be
created.**

**What people do can
affect the quality of
the water that cycles
around the earth.**

vocabulary

water cycle
evaporation
condensation
precipitation
transpiration

kupu

mataora wai
water cycle

wai	water
awa	river
roto	lake
moana	sea

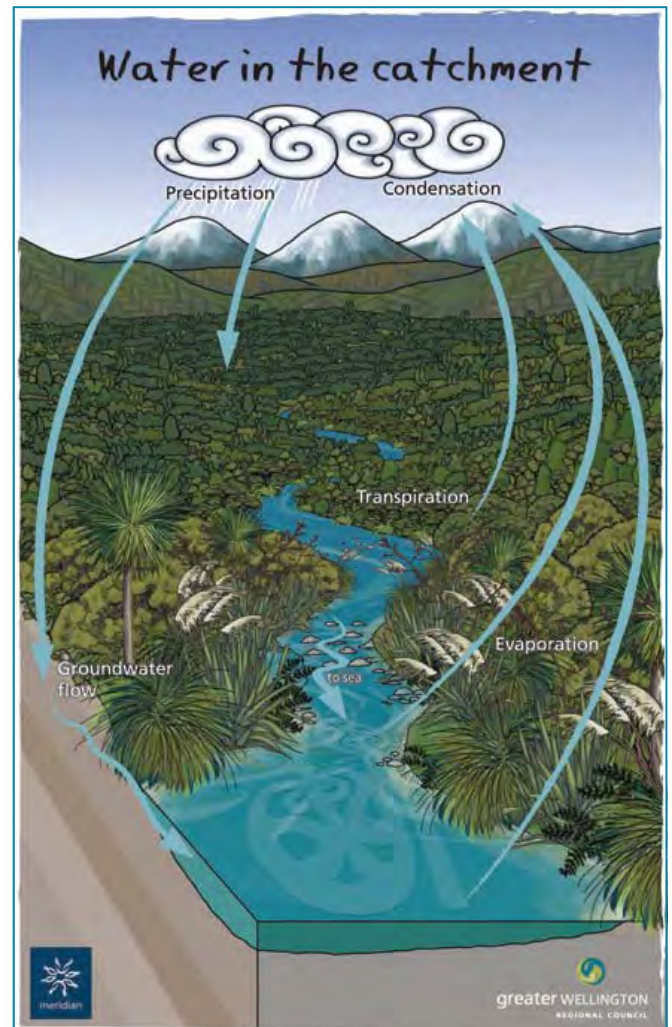


Water is precious — water is life

From the mountains to the sea

Equipment

- *Water in the Catchment* poster. This can be downloaded from Take Action for water website www.gw.govt.nz/take-action-for-water
- DVDs *Guardians of the Mauri* and *Underwater under Threat: New Zealand's Freshwater Native Fish* that can be borrowed from the Water Education Facilitator
- Student access to the online interactive activity
- *Up the Creek* at www.biodiversity.govt.nz/kids
- Show your students the *Water in the catchment* poster and discuss the concept of a catchment. A catchment is an area that catches the rain. Rain drops fall onto hills and then collect together to form small streams. Water in streams continues a journey downhill with the force of gravity. Streams become larger and can form into rivers. The rivers flow into an estuary and out to sea.
- Discuss the area of waterway you are going to investigate and map its journey from the mountains to the sea.
- Add to your map:
 - ◇ any contributing streams, stormwater drains or wetlands that are part of the journey the water in your selected.
 - ◇ waterway takes from the mountains to the sea.
 - ◇ any ways water is taken out and used by people or animals.
- You are going to conduct a practical investigation of the quality of the water in your selected waterway. However, students can make a prediction about the likely quality of the water by looking at the journey of the water and identifying where activities of people might pollute the water.



- Use the human impacts section of the *Take Action for Water* resource to understand the effect of deforestation and adding a range of pollutants has on a waterway.
- Have your students complete the Clearwater catchment scenario to consider the impact different users of a catchment can have on the catchment.



Water is precious — water is life

From the mountains to the sea continued

- Borrow a copy of the DVD *Guardians of the Mauri* from the Water Education Facilitator. The story follows the journey of two students who, after polluting the stream, are turned into fish and discover first hand the effects of human activities on the health of the stream. It focuses on the perspective that, as kaitiaki or guardians, it is our role to protect the mauri of our waterways.
- Have your students explore *Up the Creek* at www.biodiversity.govt.nz/kids
- Borrow a copy of the DVD *Underwater under Threat: New Zealand's Freshwater Native Fish* from the Water Education Facilitator. This twenty minute video introduces our native fish, the threats to their survival, and the steps we can take to protect them.



Kia pai te whakatere i te waka, Kei pariparia e te tai, Ka monehu te kura nei

Steer with skill the canoe, lest the outgoing tide endangers the lives of those on board

How does this whakataukī relate to preserving the mauri (life-force) or hauora of our waterways?



The native animals in the photographs are:

- a long finned eel
- scaup or native diving ducks
- a water spider
- an inanga or adult whitebait.



Section 3: We need water to live

Students will investigate how plants and animals need water to live when they investigate a local waterway. In this section students complete activities that prepare them so they understand what is occurring in their freshwater ecosystem when they visit it.

Plants and animals in our freshwater ecosystem

Have your students complete the activities in the Native Ecosystems section of *Take Action for Water* in preparation for their investigation of a local waterway.



Big ideas

Living things are suited to living in a particular habitat .

If the habitat is changed by natural events or by the actions of people, animals must adapt to that change or they will not survive in the habitat.

The habitats in a native forest catchment can be divided into stream, and forest habitats.



Water is precious — water is life

How do we use our water?

The world is thirsty because it's hungry

The 2012 World Water Day had the theme 'the world is thirsty because it is hungry.' Show your students two short animations from the United Nations World Water Day website to demonstrate how much water is used to create our food.

Go to www.unwater.org/worldwaterday/animation101.html. and www.unwater.org/worldwaterday/allyoueat.html. These are in the section of the unwater.org/worldwaterday website called campaign materials. If you go to educational material you can download posters and have your students use the interactive game to calculate the number of litres of water used in creating a meal they like. Some factual supporting material is available under the FAQ section.



It takes 2,400 litres of water to make a hamburger

How much water is used in the products we use?

The world is also thirsty because we use water to create the consumer products we use, for example:

- Discuss this with your students and ask if anyone is prepared to take action and save water by reducing the number of consumer products they buy.
 - ◇ 1 cotton shirt uses 4,100 litres of water
 - ◇ 1 pair of shoes 8,000 litres
 - ◇ 1 sheet of A4 paper needs 10 litres
 - ◇ 1 car needs 400,000 litres
 - ◇ 1 pair of jeans needs 10,850 litres
 - ◇ 1 bed sheet needs 9,750 litres
 - ◇ 1 nappy needs 810 litres

How much water do I use — my water footprint

- Have your students go to www.waterfootprintkemira.com/meter and calculate their water footprint. New Zealand is not listed as a country so students can either use the global average or select Australia as a country similar in water usage to us.
- When your students have calculated their own water footprint have them work in a pair or a small group and:
 - ◇ compare their results
 - ◇ discuss their results using a PMI chart
 - ◇ compare countries using the map on the footprint calculator and draw some conclusions.

Big ideas

We use a significant amount of the world's available fresh water to grow food and create the products we need or want.

We can reduce our water footprint and save water by changing the food we eat and by limiting the consumer products we buy.

World Water Day 2013 is Friday March 22.

Decide why you think 'co-operation' has been chosen as the theme for 2013.





Water is precious — water is life

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

In this section students consider water issues on the Kāpiti Coast. They consider the present and future supply of quality drinking water.

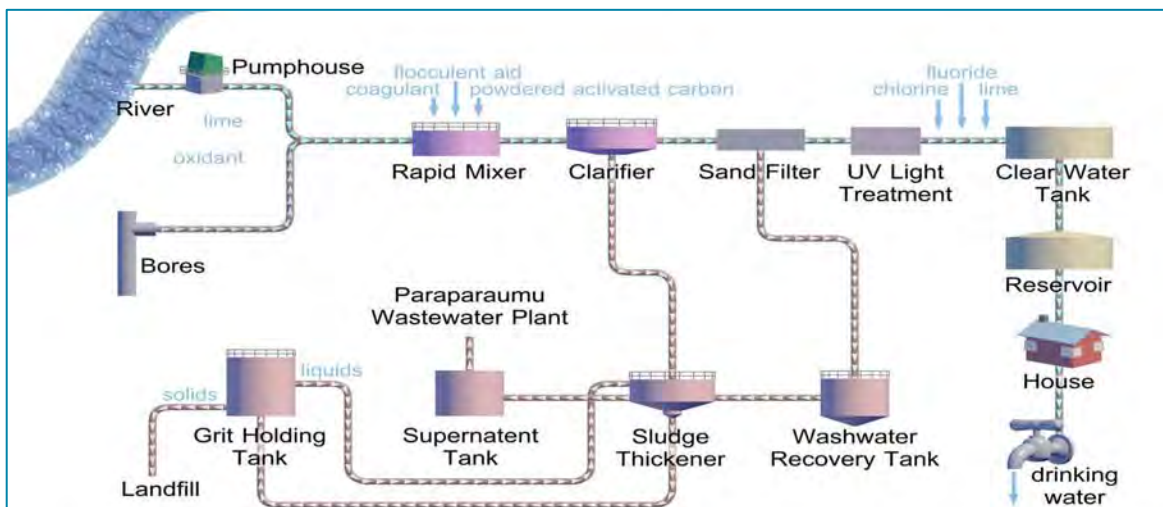
Our safe drinking water

Equipment:

- o DVD *Our safe drinking water* supplied to schools
- Show your students the DVD and discuss how your area gets a supply of drinking water and why we know it is safe to drink.
- Discuss:
 - ◇ what a resource consent is and why there is a limit on the amount of water that can be taken out of the Waikanae River
 - ◇ what happens currently in summers when the river water level is low
 - ◇ what people in the catchment do to maintain the quality of the water that reaches the Treatment Plant (*Make sure they do not put animal wastes, human wastes, soil, oil or chemicals into the water.*)
 - ◇ why chemicals are added to water early in the treatment process and then later removed
 - ◇ what chemicals are added to the treated water and why
 - ◇ what happens at each stage of the treatment.

Big ideas

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





Water is precious — water is life

Water issues on the Kāpiti Coast

- Have the Water Use Adviser come to your class and discuss water issues on the Coast. Background notes are provided here for use by your students. The Water Education Facilitator can organise this visit.
- People hold different views about issues and how to resolve those issues. Explain to your students that they are going to find out what local residents think about different ways we can reduce water usage and make sure there is enough water for us to use now and in the future.
- Focus on:
 - ◇ reducing water use by changing the way we use water
 - ◇ using water meters
 - ◇ using water restrictions in summer
 - ◇ having new homes install rainwater and greywater systems and encouraging existing homes to use rainwater and greywater systems.
- Have your students develop some questions to ask three people in the community that explore:
 - ◇ what they know about water issues on the Coast
 - ◇ what they know about each option
 - ◇ whether they support each option and
 - ◇ what action they would take or not take to support the action.
- Have your students:
 - ◇ construct a questionnaire
 - ◇ carry out their survey with three people in their community
 - ◇ feedback and analyse their results
 - ◇ draw some conclusions
 - ◇ write a report on what they found out.

Your class may want to share the results of the survey with the Water Education Facilitator. The students may decide to take action as a result of their research.

The Kāpiti Coast District Council website provides background information about all the options listed but the Water Education Facilitator can provide additional information if required, including the summary of submissions to Council about installing water meters.

This survey does not include the option of building a dam because it is a long term plan but you may wish to find a way to include it in your survey.

Big ideas

There are strategies in place to manage the water supply on the Kapiti Coast so there will be an adequate supply of water now and in the future.

Strategies involve increasing the water supply and educating residents to use less potable (drinking) water.

Residents are encouraged to install rainwater tanks, and use greywater.

Residents are encouraged to reduce their water usage particularly in the summer months.

Council have purchased land so that in the future a dam can be constructed to provide an increased water supply in the future.

The Council is adopting a new way of charging residents for water using water meters.



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Having enough water now and into the future

Historical issues

There is a limit of how much water Council can take for our water supplies because there must be enough water left for the wildlife to survive. When the levels fall past the environmental limit, no more water can be taken.

The summer in 2003 highlighted the challenges of Kapiti Coast water supplies.

The hot dry summer meant little rain was topping up the rivers. As the river levels fell, the amount of water available for the water supplies fell too. This was right at the time people were using water the most, to wash cars and to keep their lawns and gardens green.



Tough water restrictions were put in place that meant people could only use water in their homes and not on their gardens or to wash their cars. However as the river level continued to fall, there was not enough water available in the rivers.

Council had to make a choice between taking more water than they were allowed to or risk not having enough water for people to keep clean, drink or flush their toilets.

There was also a risk that there would not be enough water to fight fires. Council chose to take more than they were allowed (under their resource consent) and were aware they could not let this happen again.

It was a tough time for everyone and when the rains returned and replenished the rivers, people wanted something to be done.

There were obvious reasons why the shortages occurred:

- the water supplies were dependent on rivers and were vulnerable in hot summers with low rainfall
- high summer demand from people watering gardens put a lot of pressure on water supplies
- many gardens were dependent on town water supply to stay alive. People became frustrated when they couldn't water their gardens and their plants died. Those who had their own rainwater or bore supply could maintain their gardens
- the water supply networks and pipes leading into homes were aging and water that could have been used was being lost to leaks
- the towns of Raumati, Paraparaumu and Waikanae were growing quickly and more houses were built every year, putting more pressure on the water supplies
- when the river is low, algae will grow and will affect taste.



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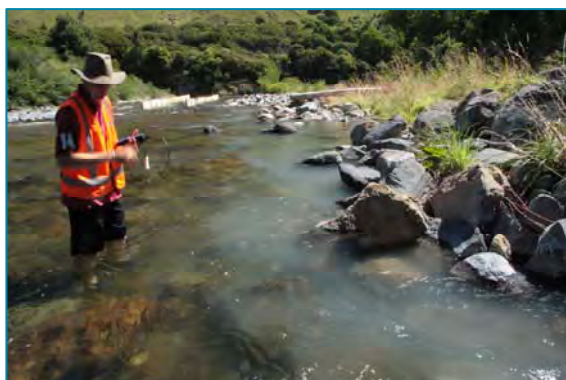
Having enough water now and into the future continued

Changing approach

In 2003 Council after talking with the public, local iwi and experts, released a 50 year water supply strategy to ensure all towns had access to a safe, cost effective and reliable water supply.

Key elements of the strategy were:

- recognition that there is a limit to how much water we can take from the natural water system
- develop water supplies that can provide water in summer months
- strengthen the tangata whenua partner role in governance (ranagatiritanga) and stewardship (kaitiakitanga) of waterways
- ensure our water supplies protect natural systems so wildlife can flourish
- people and businesses use water efficiently
- reduce the amount of leaks in Council supply and in people's homes and in businesses
- people fund water in a manner that is fair to what they use
- use rainwater and greywater to reduce the amount of water used each day and during summer.



Testing water at the Waikanae Water Treatment Plant intake

Since 2003

Water supply

Council began improving water supply to protect them against dry summers and improving the water quality of each supply.

Water Conservation

We all have a role to play in reducing the amount of water we use. This means changing our habits, fixing leaks, making our homes more water efficient (e.g. installing dual flush toilets or a rainwater tank) and gardening to the local conditions.



Council looked at ways to assist people make these changes and the following measures were put in place:

- free professional advice for residents to save water in the home and garden, as well as what to do if they found a leak
- promote rainwater and greywater for watering gardens
- continue with water restrictions and require properties to fix leaks when they are found;
- run events to promote water saving ideas, such as mulching your garden
- require new homes to install greywater and (or) rainwater for toilet flushing and watering gardens
- Council increased funding to find and repair leaks in the water supply network;
- offer assistance to households who want to install rainwater or greywater systems.



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Having enough water now and into the future continued

- Council increased funding to find and repair leaks in the water supply network
- offer assistance to households who want to install rainwater or greywater systems.



Water meters

Currently all homeowners pay for the water they use through a yearly charge. It doesn't matter if they use a lot or little, all households pay the same amount. This means there is little reason to save water as you pay the same.



Now with meters, people will be more careful about how they use water. For example rather than turning on the sprinkler and forgetting about it, paying for water will encourage you to only provide the water the garden needs, as well as add mulch, compost and choose a more efficient irrigation system.

The big savings are likely to be when people garden. Remember it is during the summer when demand for water is the highest. By being more careful in how you water in the summer, you can still have good looking gardens but save water and ensure our supply lasts for much longer.

Also without meters, it is hard to find leaks on private property. For example, as meters have been installed, one property was found to have a leak of over 30 000 litres a day! This is enough water for more than 25 households! With meters any property with a leak will quickly know and fix the leak.

For more information on why Council is implementing water meters, responsibilities of Council and the property owner, as well as how to read a water meter, you can download the document *Important information about your Water Meters* from Council website.





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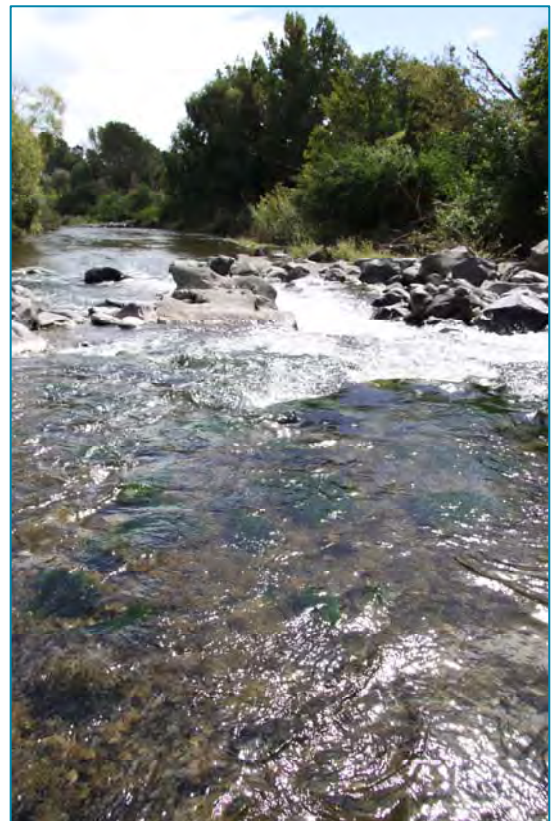
Having enough water now and into the future continued

Summary

Our rivers are an important part of the Kapiti Coast lifestyle and its important that we ensure that there is enough left for the wildlife to flourish and for us to enjoy in summer.

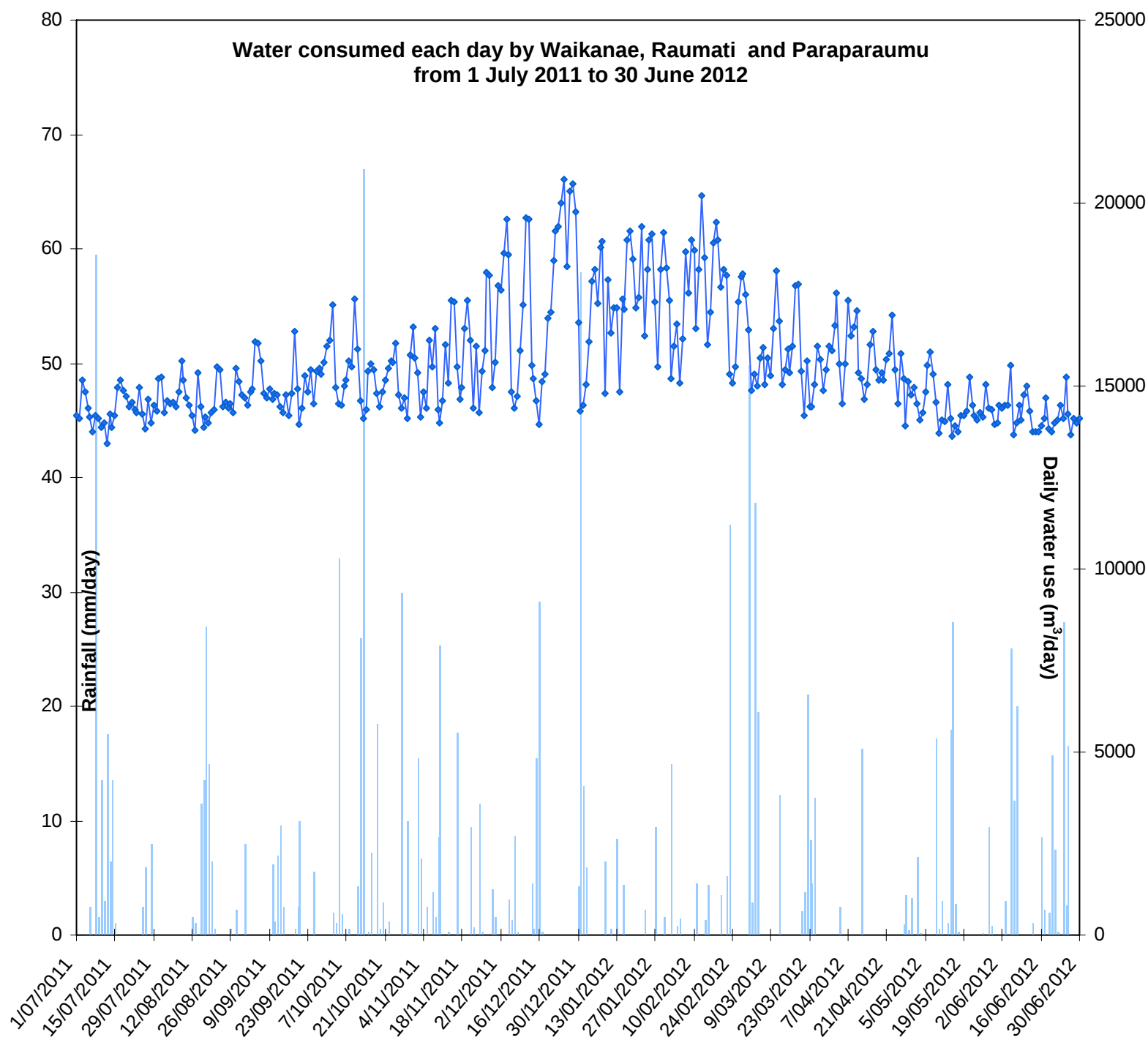
Our towns could not exist without a reliable water supply. There would be no water to keep us clean, or flush our toilets or keep our clothes smelling fresh.

To keep our water supplies reliable we all need to play a part in how we use water. What can you do to do use water without wasting it?





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Produced by Kāpiti Coast District Council.
www.kapiticoast.govt.nz

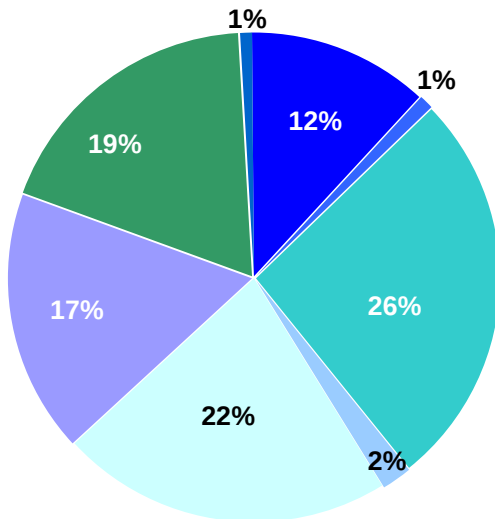
Water is precious — water is life



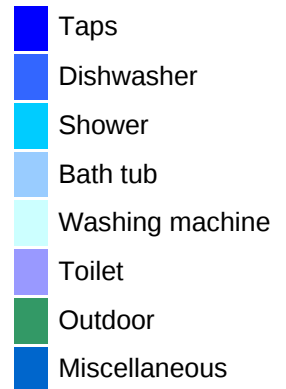
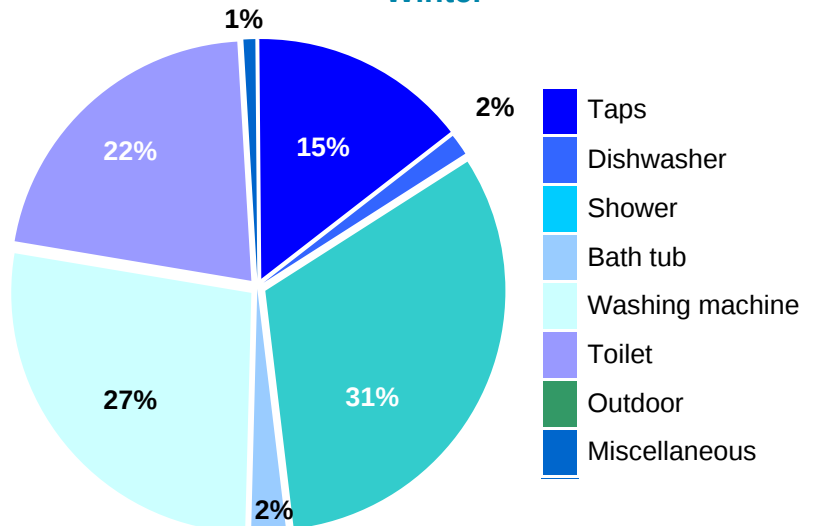
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Water use on the Kāpiti Coast

Summer



Winter



- Discuss the graph on the previous page with your students and draw some conclusions about water usage at different times of the year and on different days of the week.
- Compare these two pie charts and work out what changes occur between summer and winter.
 - ◇ What uses 20% or more of the water?
 - ◇ What is the increase in outdoor water use in summer (in percent)?
 - ◇ What do you think people do to increase their outdoor water use in summer?

One local family found out that they had a major leak in their pipes and they were wasting 30,000 litres of water a day!



If you run a tap for a minute you can let 15 or more litres of water run down the drain.

So if you run the tap for a minute twice a day when you brush your teeth, that's 30 litres of water a day going down the drain.

In countries where there is a shortage of water a person may only have 10 litres of water to use each day.



Section 5: Being waterwise and conserving water

In this section your students explore ways to be waterwise and conserve water at home and at school.

Reducing our water use at home

- Have your students complete the home water audit provided on the next pages.
- Have your students work in pairs to discuss what action they will take to reduce their own water use or their family's water use. They could use this graphic organiser to identify what will encourage them to take the action, what might be a barrier and ways to overcome potential barriers. The students may want to develop signage or tick sheets to encourage them to remember to save water.

Opportunities

Barriers

Water saving
action

Big ideas

We can reduce water use at home by

- making changes in the school garden
- changing the behaviour of students when they use water
- changing infrastructure like taps and toilets and appliances that use water
- installing rainwater systems
- using greywater.



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Saving water at home

- Use this worksheet to conduct an audit of how you and your family use water.
- Once you have completed the audit, you or you and your family can review how they use water, particularly in the summer months.
- You can take action and reduce your water use.
- You need to take the action to save water every time you do the activity. The action needs to become a habit. After it is a habit and you do it all the time for a length of time it has become a life-long practice. Then you can say it is the way you use water.
- Sometimes we need reminders to help us develop new habits. Would a sign reminding you to turn the tap off as you brush your teeth help, or a 5 minute sound time by the shower, or a tick sheet to record when you have remembered to save water?
- Use the information sheet to help you decide what action(s) you will take to save water.

Personal water use

Column A How I use water	Column B Doing this once will use an average of ...	Column C How many times I use water in this way each day ?	Column D How much water is used? (multiply Columns B by C)
Flushing the toilet	10 litres		
Having a bath	100 litres		
Having a shower	12 litres each minute	(x minutes you spend in the shower)	
Washing hands	5 litres		
Washing face	5 litres		
Brushing teeth	2 litres		
Any other use?			
			Total (add up Column D) _____ litres used



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Family water use

Column A How we use water	Column B Doing this once will use an average of ...	Column C How many times we use water in this way each day	Column D How much water is used (multiply Columns B by C)
Dishwasher	65 litres		
Washing dishes in the sink	15 litres		
Insinkerator (garbage disposal)	28 litres	(x minutes you spend in the shower)	
Washing machine Full load	150 litres		
Washing Machine Half Load	90 litres		
Hose use (washing car, watering garden etc.)	14 litres per minute		
Preparing a meal	15 litres		
Housework / cleaning	15 litres		
Any other use?			
To calculate an estimate of how many litres of water your family used in 24 hours Multiply your personal usage by the number of people in your family My personal use of — litres X the number of people in my family is — litres Add your family water use total to this Our family's water use for 24 hours is estimated to be — litres.			Total (add up Column D) —— litres used

Some of us make a great start to developing a water saving habit then we get slack and go back to our old ways.

Work out how to monitor how you are going and, if necessary, what you can do to get back on track to save water.



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Using water in the home

Water use area



How much does the average home 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.

What can we do to reduce our use?

- 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.

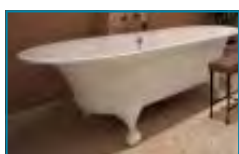
- Fix dripping taps.
- Don't leave the tap running when you clean your teeth.
- Don't leave the tap running to rinse the dishes or when you peel vegetables.



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.



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Reducing our water use at school

This activity focuses on an audit of school water use and an action plan to make a change in the way the school or school students use water. You can select an audit methodology that suits your school.

An audit is outlined in *Turning on the Tap* at www.gw.govt.nz/turning-on-the-tap. Another audit is outlined on the EnviroSchools Measuring Change website under *Water of Life*. www.measuringchange.org.nz/audit-tools/water-of-life

- Have your students conduct a school audit using the audit tools outlined on one of the websites.
- After completing the audit your students may want to gather more supporting information by interviewing students and school staff.
- Adapt the *Take Action* planning process from *Take Action for Water* or use any action planning process your students are familiar with to enable your students to:
 - ◊ prioritise an action or actions the school can take to reduce water use
 - ◊ plan for action
 - ◊ act
 - ◊ reflect and evaluate the action taken.

The Be Waterwise Garden Competition

Your students may want to create a garden for the Waterwise School Garden Competition that is part of Sustainable Home and Garden show each March. The Water Education Facilitator has entry forms for this competition.

Big ideas

We can reduce water use at school by

- making changes in the school garden
- changing the behaviour of students when they use water
- changing infrastructure like taps and toilets and appliances that use water
- installing rainwater systems



Raumati School's 2012 waterwise garden





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Section 6: Taking action for water

In this section your students complete a study of your local waterway using material from *Take Action for Water*. After this study students use action planning tools to plan an appropriate action to maintain the quality of water in our waterways and preserve their habitat of the plants and animals that live there.

Investigating your local stream or other waterway

- Use the Explore Day section of *Take Action for Water* to plan and conduct a field trip that investigates your selected stream or other waterway.
- After the students have analysed the results of their investigation use the Take Action section of *Take Action for Water* to take any action they decide is appropriate, and monitor and evaluate that action and reflect on their learning. It is expected that schools will use an action planning process their students are familiar with to complete this.

Unit conclusion and reflection

Life - long learning about water

- Have your students reflect on the learning programme and extract the big learning that will impact on the way they use and value water throughout their lives.
- They could work individually, in pairs or in groups and work out what they would tell a visitor from another planet about the importance of water and how to conserve it and about our local waterways. They could then present this information in a visually interesting way. This could include: comic strip, photograph and caption sequence, rap, drama, PowerPoint presentation, speech, poster, film script or film.
- This material could be the basis of a short video to enter in the Department of Conservation Big Picture award. Visit www.doc.govt.nz/documents/getting-involved/.../big-picture.pdf
- Have your students develop a power point presentation that demonstrates the 'key learning' learning they are storing away or taking home after completing this unit. They may want to use a range of graphic organisers to reflect on their learning and link their ideas.

Big ideas

We can act as guardians of water and encourage people to:

- reduce their water usage
- act to maintain the quality of water in our waterways and preserve the habitat of the plants and animals that live there.

We can:

- reduce our own water usage
- make sure what we do does not pollute or harm our unique waterways and the plants and animals that live there.

