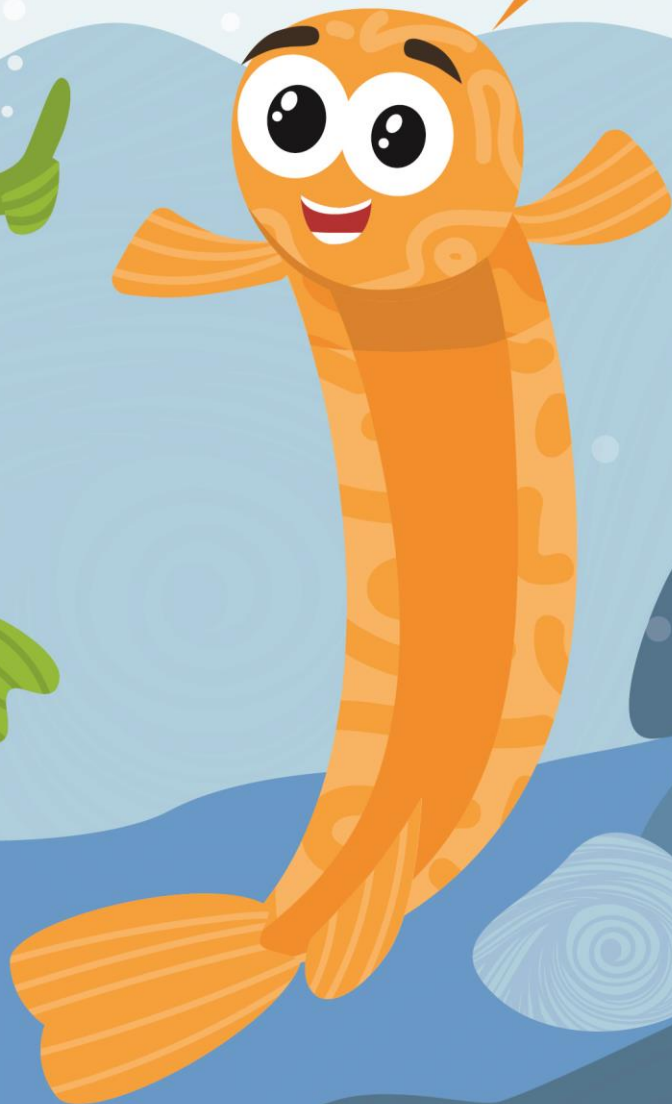


HE PUNA WAI

Hi I'm Ian the
Inanga



I'm Koro the
Kokopu



How are we using
water?

How are we using water?

be a
Wai
Warrior



Activity	Subject Areas	Inquiry Stage
6	Maths and Science	3. Pūhuru: Splash around

Q Overview

Let's investigate how much water we are using at home, and what the patterns are for water use in New Plymouth District over the year.

Key Concepts	
	<ul style="list-style-type: none">• Students investigate and record their daily water use. Results are then combined to find averages and total water use for a day.• Kaitiakitanga: as water users and recipients of the gift of clean water, every one of us has a responsibility to take care of water and use it carefully.

🔗 Curriculum links

New Zealand Curriculum

Learning Areas	Levels	Years
Mathematics Statistical investigation	3-4	5-8
Science Nature of Science: Investigating in Science		

🧠 Learning intentions

Students are learning to:

- Investigate and survey how much water they are using at home in an average day.
- Use data and evidence to support or challenge their ideas.

📖 Success criteria

Students can:

- Record their water use at home and reflect on their results.
- Sort and use data to find average results for a day.

Whakatauki

He aha te mea nui o te ao? He tangata, he tangata, he tangata.

What is the most important thing in the world?

It is people, it is people, it is people

Background information: How much water are we using?

Water use in the home

Safe drinking water is delivered to your home through the drinking water network.

A lot of this water is used:

- In the bathroom: in toilets, sinks- brushing your teeth and washing, showering and bathing.
- In the kitchen: washing dishes and preparing food and using the dishwasher.
- In the laundry: cleaning your clothes using the washing machine and sink.
- During summer: more water is used outside for watering gardens.

All water must meet strict standards for public health and has been treated to high standards. Therefore, we must be careful with water and not waste it; it is a precious resource.

Te mana o te wai

Te mana o te wai is a universal concept that is used by many water authorities and environmental agencies to help in decision making and water allocation.

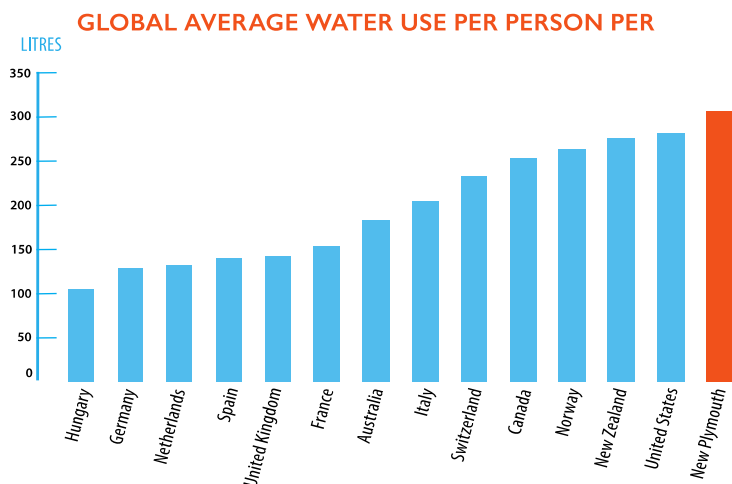
From a Māori world-view, water is sacred. Water has healing and cleansing properties and is essential to the wellbeing of all life on Earth.

We can protect the mana of water by acknowledging that water belongs to rivers and streams first. Respect for water is shown by not wasting this most valuable taonga. Protecting the mana of water ensures that our waterways remain sustainable, clean and healthy. We must never take more than we need, to ensure that waterways remain full enough to sustain all life living in, on or around them.

Do New Plymouth district residents use a lot of water?

People who live in New Plymouth District currently use approximately 292 litres per person, per day (292 L/p/d). That's equal to about three bathtubs full of water!

Only a small percentage of these 292 litres is needed for essential things like drinking and cooking. A lot of water is used for bathing, washing, toilet flushing, watering the garden and recreational use.



Our district's average water use per day is higher than the average of many countries, and we use a relatively large amount of water when compared to people in most other New Zealand cities (the national average is 275 litres).

The United Nations recommends a basic water requirement of 50 litres per person per day. Source: <http://www.newint.org/issue354/facts.htm>.

Having water for everyone in New Plymouth District in the future will rely on water conservation by everyone in the community. We need to find a balance between water allocation for households, industry, agriculture and the environment.

If we all use less water, more like the New Zealand national average of 275 litres, it would save about 18 litres of water per person, per day. If everyone in New Plymouth District saved 18 litres a day, this would add up to a water saving of over one million litres every day!

Saving 18 litres is easy! You could collect rainwater for the garden, have shorter showers, have a shallow bath, turn the taps off when you brushing your teeth, and not leave the taps running.

Gross vs net water use per person

The figure of 292 litres per person, per day is a net figure. Net figures are based on water use in homes only. The net figure does not include all the other water needed to keep the city going. Gross water use figures include firefighting, pipe maintenance, leaks from pipes, and commercial and industrial water use.

Kaitiakitanga

Through kaitiakitanga, humans have a responsibility to keep the physical and spiritual balance of the environment intact. Water resources are governed by customary rules and traditions, including keeping to tikanga. Traditional ways of managing water are able to ensure enough resources are handed down to the next generation, to maintain the mana and mauri of the water.

Summer water use and restrictions

People often want to use the highest amounts of water during summer, when the flows of rivers and streams are at their lowest. People use more water in summer because they water their gardens, use sprinklers and hoses, wash cars, fill pools and play with water outside.

In order to ensure there is enough water for the environment and people, we have water restrictions from 1 January to 31 March (unless circumstances require this to start earlier or end later). There are four levels of water restrictions. Level one means there is a ban on unattended hoses, irrigation systems and sprinklers. People are allowed to use their hoses on an odds and evens system: at odd-numbered houses on odd-numbered days and at even-numbered houses on even-numbered days.

Check on the New Plymouth District Council website for more information on water restrictions:

www.newplymouthnz.com/en/Residents/Your-Property/Water/Water-Restrictions

Other background information

Websites:

NPDC- Wai Warrior video <https://www.latest.facebook.com/NewPlymouthDistrictCouncil/videos/2294217270875831/>

Blue house water loving home by watermark <https://www.smartwatermark.org/blue-house/>

Smarter homes water: <https://www.smarterhomes.org.nz/smart-guides/water-and-waste/efficient-use-of-water/>

LAWA (Land, Air, Water Aotearoa) website: <https://www.lawa.org.nz/explore-data/taranaki-region/water-quantity/>

Learning experience: How much water are we using?

These are suggestions only and are intended to be altered to suit your students and their needs.

Resources

Student Activity Sheet 6:	Water Survey Page 6-7, Water Saving Quiz Page 8
New Plymouth District Council website: Residents' water use graphs	https://www.newplymouthnz.com/Residents/Your-Property/Water
Presentation	Water use

Continuing your learning Inquiry

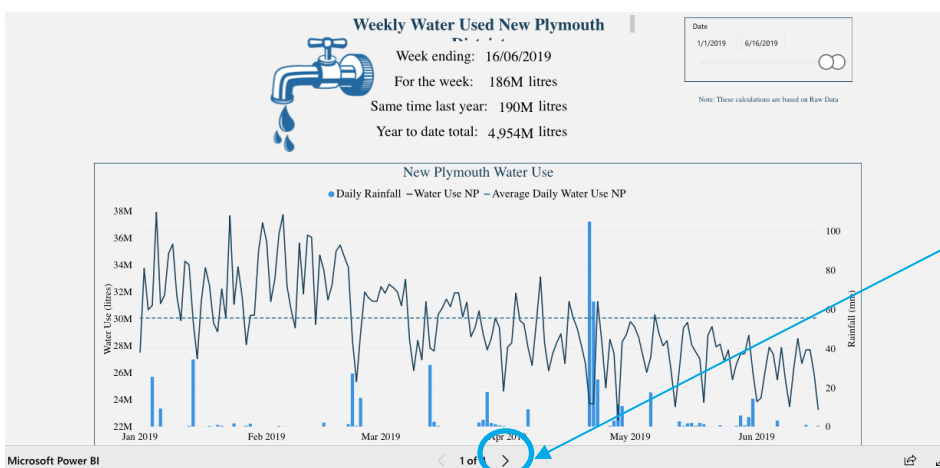
- Reflect on your findings during your learning inquiry. What further questions do you have? Record your questions and investigate them further through your own research.
- How much water do you think you and your family use in one day? Make a prediction about your water use and record your prediction for later reference.

Water use in New Plymouth

Visit New Plymouth District Council's website to see actual water use over the last few months. To view a recent graph of water use data for the district, see: <https://www.newplymouthnz.com/Residents/Your-Property/Water>

Examine the graph below which shows water use from January 2019 to June 2019. See if you can answer the questions below:

- At what times of the year are the largest amounts of water used? (January/February: Summer.)
- When are the least amounts of water used? (May/June: Winter.)
- What patterns can you see in the graph?



Click on the arrow circled in orange on the webpage to find out more about water use in other towns in New Plymouth District.

- Do these patterns have anything to do with the weather or the seasons? Why is this?

Surveying water use at home

Use *Student Activity Sheet 6: Water survey* on Pages 6-7 to record your water use at home for one day. During the weekend, when you are at home most of the day, is ideal but any day will do. Record your results on the water survey activity sheet. The water survey could be set as a homework assignment.

Ask students to share, compare and discuss their results. Find any significant differences with water use and discuss the reasons for these, for example large families, lots of animals, garden watering a pool, etc.

Reflection

New Plymouth District Council has a target of helping residents to use less than the New Zealand national average, which is 275 litres (L) of water per person, per day. If everyone makes small changes to their daily habits, we'll see a big drop in our district's average water use.

- How much water do you use per day?
- Is your amount less than 275 litres (the New Zealand national average)?
- How could you use less water?

Reflecting on your prediction

- Was your prediction close to your actual water use amount? Why/why not? What surprised you?

Extending learning

Water use at school using the water meter

- Measure your water use at school using the water meter with this Smartwater learning activity: http://www.smartwater.org.nz/uploads/files/educate/section_5.pdf (pages 92-99).
- If you would like guidance about reading your school water meter and working out the school's water use, please contact New Plymouth District Council's Three Waters Education Officer on 06-759 6060 or email edthreewaters@npdc.govt.nz
- How would water allocation in your area change if we thought more about te mana o te wai? (Thinking about te mana o te wai would be thinking about leaving more water in streams, rivers and the environment in order to sustain our waterways this would result in less being taken from the environment and the need for us to use water wisely and not waste it.

Action ideas

Read and complete the *Our Water: Be a Wai Warrior brochure* to learn more about how you can save water and water use in Taranaki: <https://www.newplymouthnz.com/-/media/NPDC/Documents/Residents/Your%20Property/Wai%20Warrior%20Brochure.ashx>

Kaitiakitanga

- What does it mean to be kaitiaki for water? How can we action kaitiakitanga and look after water for the future?
- Examine actual survey results and find where in your house you are using the largest amounts of water. Why is this?
- Looking at your survey results, what changes could you make to reduce your water use? Make a plan using Activity 8: Looking after our water.

Student Activity Sheet 6

Water survey – water use in your home

Let's find out how much water you use each day in your home.

Use the approximate amounts given or measure how much water your fittings use by turning on your taps/shower and filling a jug or 10L bucket to see how much it fills in one minute. Record the amount to use in your calculations. For this survey you will need to take note of all the water you use in one day.

Bathroom

Water use per day in your bathroom

Bathroom fitting	Number of times used per day	Water used each time	Total water used PER DAY (litres)
Shower (10 L per minute) OR _____			
Bathroom tap (10 L per minute) OR _____			
Bath (70-90 L per bath)			
Toilet (standard full flush =8 L, half flush 4 L)			
Other:			
Total water used in your bathroom per day			

Kitchen

Water use per day in your kitchen

Kitchen appliance/fitting	Number of times used per day	Water used each time	Total water used PER DAY (litres)
Dishwasher (about 30 L per load)			
Kitchen tap (approximately 10 L per minute) OR _____			
Water for cooking			
Drinking water			
Other:			
Total water used in your kitchen per day			

Laundry

Water use per day in your laundry

Laundry appliance/fitting	Number of times used per day	Water (L) used each time	Total water used PER DAY (litres)
Washing machine Front loader 50L, top loader 100L			
Laundry tap (10L per minute) OR _____			
Total water used in your laundry per day			

Outdoor use

Water use per day outdoors

Outdoor water use	Number of times used per day	Water (L) used each time	Total water used PER DAY (litres)
Watering garden one bucket = 10L Hose (controlled handle) 900L per hour, sprinkler 1300L/hr, uncontrolled hose 2000L per hour			
Car washing One bucket = 10L, hose (controlled handle) 900L per hour, uncontrolled hose 2000L per hour			
Other:			
Total water used outdoors per day			







Summary of results

Total water used per day

Bathroom Total	Kitchen Total	Laundry Total	Outdoor Total	Total household water use per day in litres (add up all of the above)	Total water use per person per day (Total household water divided by the number of people living in your house)
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Interpreting your results

Are you a:

 High water user? More than 280L per person, per day	 Average NZ water user? 260-280L per person, per day	 Water saver? 260-100L per person, per day	 Super water saver? Less than 100L per person, per day
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be a
Wai
Warrior



Water-saving quiz: how water efficient are you?

Earn a water-saving drop for every 'always, yes' or water-saving answer.



1. Do you turn the tap off when brushing your teeth?

- Always
- Sometimes
- Occasionally
- Never

2. Do you have short showers (less than five minutes) or shallow baths?

- Always
- Sometimes
- Occasionally
- Never

3. Do you use a bucket, not a hose, when washing your car?

- Always
- Sometimes
- Occasionally
- Never

4. Do you start the washing machine and dishwasher only when they are full?

- Always
- Sometimes
- Occasionally
- Never

5. When you wash vegetables do you turn the tap off and not leave it running

- Yes
- No

6. Do you water the garden only every few days in summer?

- Yes
- No

How are you already saving water at home and school?

How many water saving drops did you get?



How could you and your family use less water?

Choose one water action that you and your family could do to save water from now on

