

HE PUNA WAI

Hi I'm Ian the
Inanga



I'm Koro the
Kokopu



Contents

Introduction

Acknowledgements
Introduction
Integrated Inquiry Cycle
Example unit plan

1. Water in Taranaki

Overview
Background information
Learning experience ideas
Student Activity Sheet 1 – Pepeha

2. Inquiry into water

Overview
Background information
Learning experience - Inquiry into water
Integrated inquiry cycle
Student Activity Sheet 2
Inquiry plan for water in your environment
Inquiry stage 2: Pātai wai
Water learning journal

3. Water to drink

Overview
Background information
Learning experience - Water to drink
Student Activity Sheet 3
Water's journey to our taps

4. Experimenting with flocculation

Overview
Background information
Learning experience
- Experimenting with flocculation
Experiment
Student Activity Sheet 4
Observations of flocculation

5. Stormwater

Overview
Background information
Stormwater pollutant problems
Learning experience - Stormwater
Student Activity Sheet 5a-5b
Stormwater Bingo
Stormwater actions

6. How are we using water?

Overview
Background information
Learning experience
How much water are we using?
Student Activity Sheet 6
Water survey – water use in your home
Water-saving quiz

7. Wastewater

Overview
Background information
Learning experience - Wastewater
Student Activity Sheet 7
Wastewater Treatment
Experiment
Student Activity Sheet 8
Observing changes in a 'wastewater system'

8. Looking after water

Overview
Background information
Learning experience
- Looking after our water
Inquiry stage 4: Wānanga wai find your flow
Wānanga wai find your flow reflection
Inquiry stage 5:
Whakaaro wai Reflect and share about water
Inquiry stage 6: Mahia wai
Mahia wai action examples
Student Activity Sheet 9
- *Plan for looking after water*

Acknowledgements:

We would like to acknowledge the support and help of the following people in creating this resource: Anne-Maree McKay, Pou tangata taiao, Ngāti Mutunga.

*Published by: New Plymouth District Council
Written by: EFS Initiatives*



Introduction

About this resource

This resource aims to provide students, teachers and their communities with opportunities to grow their knowledge, skills and understanding about water so that they can use water wisely and help resolve water-related environmental challenges.

He Puna Wai is an integrated curriculum teaching resource with water in Taranaki as a context for teaching and learning. The resource links to the New Zealand Curriculum at levels 1-4 and has been developed for primary school students and teachers (Years 1-8). It is also easily adapted for use at various levels, including early childhood and secondary level.

The resource is based on current Environmental Education for Sustainability (EEfS) understandings and Guidelines for Environmental Education in New Zealand (Ministry of Education, 1999).

Overlying conceptual understandings for the resource

- All water is a single, connected entity with its own life force.
- Clean, fresh water is an important part of our lives and we need it to survive.
- We can all help to protect and preserve the health of our water.

Taranaki: He puna wai

Taranaki has no fewer than 530 named rivers and streams and 20,000km of waterways. There are 19 lakes with an area greater than 8ha and more than 1,200 wetlands in the region.

More than 300 rivers and streams flow from Mount Taranaki in a distinctive radial pattern across the ring plain.

Typically, these ring plain rivers and streams are short, small and fast-flowing. Te Papakura o Taranaki acts as a huge reservoir, supplying a steady flow of water even during prolonged dry periods.

Māori perspectives

This resource incorporates Māori perspectives alongside western thinking. It weaves Māori cultural knowledge, kaupapa and te reo Māori into the learning experiences. Examples of concepts from te ao Māori that are woven through the resource are kaitiakitanga, mauri, te mana o te wai and ki uta ki tai.

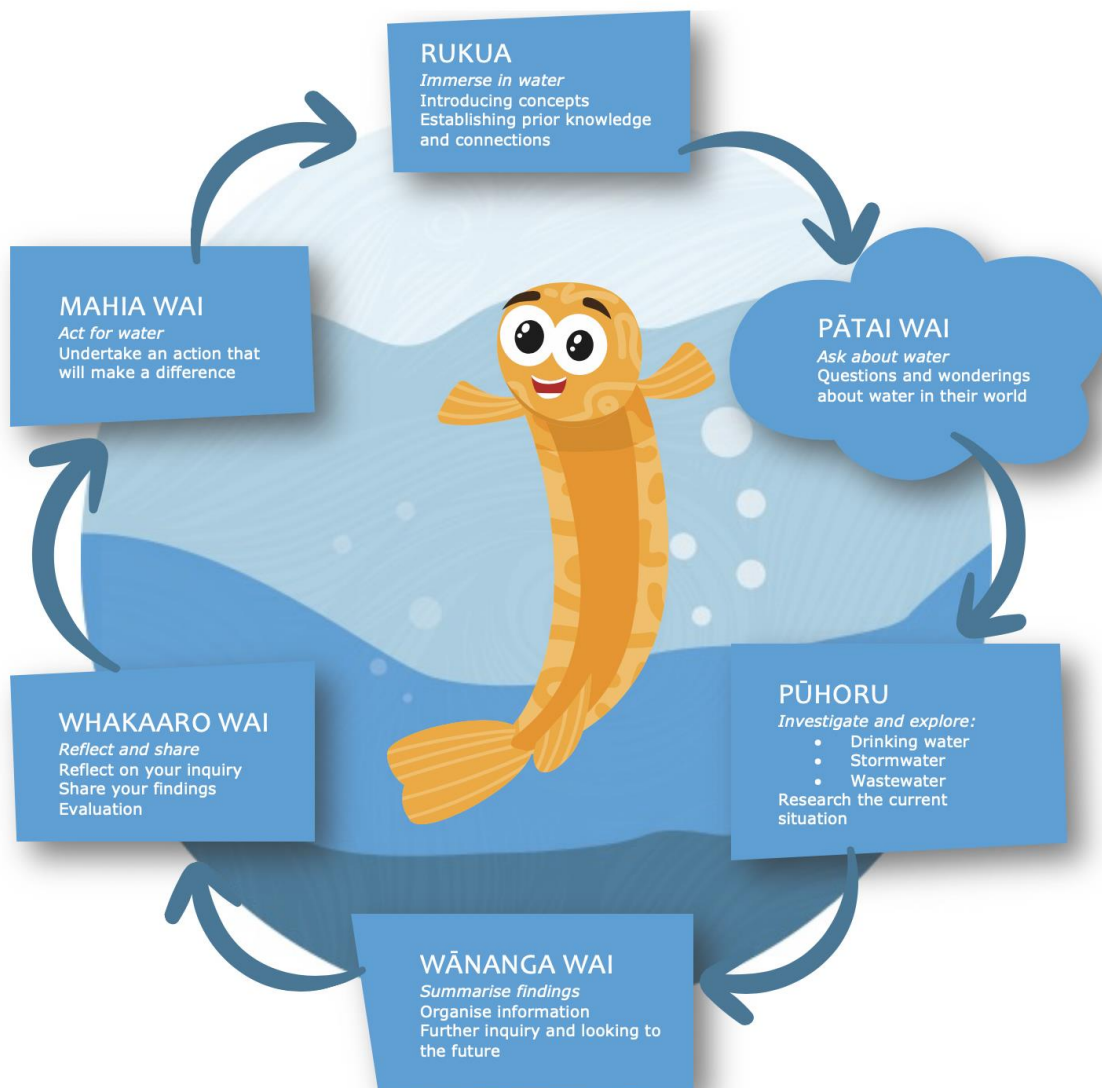
For more information on teaching about te ao Māori and history in the New Zealand classroom, see the Te Takanga O Te Wa history guide: <http://maorihistory.tki.org.nz/en/programme-design/te-takanga-o-te-wa-maori-history-guidelines-year-1-8/>

Integrated Inquiry cycle

This resource is based on an integrated inquiry learning cycle. The cycle is a process for guiding student directed learning and co-constructing a pathway of inquiry when learning in a sustainability context. An inquiry-learning approach crosses all curriculum areas and provides a framework to support students to plan their investigations and implement their actions.

Using the inquiry cycle

Teachers and students can follow the steps in the cycle and then select material and parts of activities from the resource materials provided to suit their needs, interests and learning pathways. The inquiry cycle follows a thread throughout the resource and each inquiry step is described in Activity 2: Inquiry into water. The resource is not intended to be taught from beginning to end but can serve as a pool of ideas to draw from and be inspired by. The learning should be non-linear: only utilising the relevant parts which match your students' interests and needs.



Example unit plan

Key outcome: Students who are working with their schools and communities to grow their knowledge, skills and understandings about water and caring for water.	Curriculum areas: Science, Social sciences, English, Mathematics, Technology, Health.	Levels: 1-4 Years: 1-8
---	---	---

Overarching learning outcomes:

Connections, knowledge and understandings

Students can:

- Form personal connections to water in their local environment.
- Grow their wider understandings of water.
- Recognise the role of tangata whenua in water conservation and management.
- Learn skills to help address water issues and care for water in their lives.

Taking collective action

Students can:

- Act alongside the wider community to contribute to healthy waterways.
- Share their findings, reflect on action and celebrate success with their community.

Values	Ecological sustainability, equity, respect, inquiry and curiosity, innovation, diversity, community and participation, aroha, kaitiakitanga, resilience.
Key competencies	Thinking; Using language, symbols and text; Managing self; Relating to others; Participating and contributing
Principles	Learning to learn, Cultural diversity, Treaty of Waitangi High expectations, Inclusion, Coherence Community engagement, Future focus

Lesson sequence	 Inquiry stage/s	Curriculum links (levels 1-4)	Key concepts	Description
1. Water in Taranaki	1. Rukua: Immerse in water	Science: Planet Earth and beyond – Earth systems	Water in the Taranaki landscape Water is a precious taonga that we need to care for and look after	View an introductory slideshow about water Create a pepeha about our connections to the landscape
2. Inquiry into water	2. Pātai wai: ask about water	Integrated curriculum areas	Introducing the inquiry cycle	Wonderings and questionings about water
3. Water to drink	3. Pūhoru: Investigate and explore	Technology Nature of Technology; Characteristics of technology Social Sciences	Taranaki water supply and how water is collected and treated (brief description)	The water treatment process How water is distributed to homes and schools: the water network
4. Drinking water experiment: flocculation	3. Pūhoru: Investigate and explore	Science: Nature of Science	Understanding what flocculation/clumping is and investigating in science	Experimenting with the idea of flocculation in dirty water
5. Stormwater	3. Pūhoru: Investigate and explore	Science: Planet Earth and beyond, Nature of Science: Investigating in science, English: Listening, reading and viewing	What is stormwater and where does it go? Mauri and stormwater pollution	Investigating stormwater structures and pollution
6. How much water are we using?	Whakaaro wai: Reflect and share	Science: Planet Earth and beyond, Nature of Science, Social Sciences, Mathematics: statistics	Understand how much water they are using at home Looking at water use patterns of New Plymouth residents	Water survey of how much water is used in different areas at home Investigating graphs and data of water use
7. Wastewater	Pūhoru: Investigate and explore Wānanga wai- Find your flow	Science: Nature of Science: Investigating in science; Material world: Chemistry and society	Wastewater has to be treated at a wastewater treatment plant before it can be discharged and the wastewater treatment process	Experiment showing what happens if we put the wrong items into wastewater system
8. Looking after our water	Whakaaro wai: Reflect and share about water Mahia wai: Act for water	Science: Nature of Science: Participating and Contributing. Health: Healthy communities and environments; People and the environment	Kaitiakitanga: looking after our water and what we can do	Implementing an environmental action to make a difference to water in the region