**ACTIVITY: Wai words**

**Activity idea**

In this activity, students learn and practise using science content vocabulary associated with wai, water monitoring and water quality.

By the end of this activity, students should be able to:

* read some or all of the content vocabulary words
* match some or all of the content vocabulary words to their definitions
* recite or paraphrase some of the definitions without looking at the cards
* group words in categories of their own choosing.

# For teachers

## Introduction/background

Content vocabulary is an important aspect of science knowledge and understanding. Marisa Cohen recommends the explicit and direct instruction of content vocabulary:

While a good command of vocabulary is necessary for all subjects, its effects on learning are even more apparent in content areas such as science. Science has its own language, one in which students are introduced to either completely new words or novel uses of familiar words. Students also must be able to connect the vocabulary word to the underlying concept in a deep and meaningful way. Yore, Craig, and Maguire (1998) found that efficient, successful readers of science text material “realize that words are labels for ideas … and text is stored descriptions of ideas.” Effective learners do not treat the word as an isolated piece of information, but rather as a part that enables them to develop a complete understanding of the content they are learning.

(Cohen, M. T. (2012). The importance of vocabulary for science learning. *Kappa Delta Pi Record*, *48*(2), 72–77. <https://doi.org/10.1080/00228958.2012.680372>)

## Teaching suggestions

The student handout has a selection of words associated with the water cycle, use of water, water quality, stream monitoring and uses or descriptions of wai in te reo Māori.

Consider which words your students are likely to encounter and will need to know, taking into account student ability and prior knowledge. If you print the cards for student use, hold back the word cards you do not wish to use. These may be used later for extension purposes.

Choose the content vocabulary words you want students to know and employ some of the strategies listed below to aid student knowledge and understanding:

* Introduce a word and ask students to use think-pair-share to define the word orally, in writing or with a quick sketch. Check the meaning with another group or the class.
* Use the online flipcards to practise word recognition and definitions.
* Print the student handout so pages are back to back, creating flashcards. (For older students, research suggests that writing the answer prior to flipping over the card provides deeper understanding, rather than promoting simple rote learning.)
* Use the flashcards to create groups of words. There is no right or wrong way to do this, but students have to justify why they have created particular groups.
* Locate or draw images that illustrate the word and/or concept it represents.
* Refer to the words in context. For example, ask students to choose/group flashcards to use with the Rivers and Us downloadable PDFs [The Water Cycle (unlabelled](https://static.sciencelearn.org.nz/documents/files/000/000/822/original/The_Water_Cycle_%28unlabelled%29.pdf?1582928323)), [The Water Treatment Process](https://static.sciencelearn.org.nz/documents/files/000/000/825/original/The_water_treatment_process.pdf?1582928522) and [The Waste Water Treatment Process](https://static.sciencelearn.org.nz/documents/files/000/000/826/original/Wastewater_treatment_process.pdf?1582928595).
* Use an online map of Aotearoa New Zealand to look for place names beginning with ‘wai’. Refer to the descriptions of wai in te reo Māori and create a story to explain why a location might have the name it does.

# For students

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| **algae** | Small, often microscopic plants. |
| **aquifer** | A large underground space between the rocks where water seeps. |
| **biodiversity** | The range of species found in a particular region. |
| **catchment** | An area of land that provides water to a stream, river, lake or estuary. |
| **cobbles** | Small rocks and stones in the bed of a stream. |
| **condensation** | The process by which a gas or vapour becomes a liquid, for example, when water is cooled, it changes from water vapour into liquid water. |
| **drainage** | Lowering the water table to achieve productive land use for agriculture, horticulture, building etc. |
| **effluent** | Liquid waste material such as sewage or from a milking shed. |
| **erosion** | The wearing down or washing away of the soil and land surface by the action of water, wind or ice. |
| **eutrophication** | The enrichment of water by nutrients such as nitrogen and phosphorus and organic matter such as plants. |
| **evaporation** | The process in which a liquid changes into a gas, usually as a result of heating. |
| **flocculate** | The process in which small particles in a liquid stick together to form clusters. Flocculation agents are used in the water treatment process to gather solids together. |
| **groundwater** | Water that is stored in the spaces between underground rocks and soil. |
| **habitat** | The natural environment in which an organism lives. |
| **headwaters** | The upper catchment or origin of a stream or river. |
| **invertebrate** | An animal that does not have a backbone, for example, snails, insects and worms. |
| **larva** | Developmental stage in an insect’s life between the egg and the pupa or adult. |
| **macroinvertebrate** | An organism without a backbone or internal skeleton large enough to be visible to the naked eye. |
| **mauri** | Life force and spiritual life principle. |
| **non-point source discharge** | A discharge that does not come from one specific point or place. It comes from many individual places or a widespread area. |
| **nutrient** | A substance that provides nourishment for growth or metabolism. |
| **outlet** | The point where the water in a stream or river joins another water body. This may be another stream, river, wetland, estuary or the ocean. |
| **pH** | A scale of acidity and alkalinity from 0–14. 7 is neutral, with numbers less than 7 representing acidity and those greater than 7 representing alkalinity. |
| **point source discharge** | A source of pollution that can be traced to a particular site or pipe. |
| **pollution** | An unwanted change in the atmosphere, water or soil that can harm living organisms. |
| **pollution tolerance index (PTI)** | A scale by which certain species of invertebrates are identified as living in particular quality of water. The higher the number, the better the water quality required by the animal. |
| **precipitation** | Water falling in a liquid or solid state from the atmosphere to Earth such as rain and snow. |
| **predator** | An organism that obtains its energy (food) by consuming – usually killing – another organism (the prey). |
| **pupa** | A developmental stage in an insect’s life cycle between the larva and the adult stage. |
| **resource consent** | An agreement between a regional council and a person/business/group to carry out an activity using a natural resource. |
| **riffles** | A stretch of a stream where the water is flowing over small rocks and cobbles and the water appears white and bubbly. This process helps to oxygenate the water. |
| **riparian** | A strip of land, which can vary in width, next to a waterway. |
| **run-off** | Water that is not absorbed by soil and drains off the land into lakes, rivers, streams or the ocean. |
| **sediment** | Small bits of soil, plant and/or animal matter that is carried in water. |
| **silt** | A granular material. Silt may occur as a soil or as suspended sediment in water. It may also exist at the bottom of a water body. |
| **stormwater** | Rainwater that drains off the land, usually from paved areas. Stormwater drain systems usually flow into rivers, lakes or the ocean. |
| **surface water** | Water found in streams, rivers, lakes and wetlands. |
| **topography** | The natural surface features of the land area, its shape and height of the hills and valleys. |
| **transpiration** | The process by which plants release water into the atmosphere. |
| **turbid** | A measure of water clarity. High turbidity may occur when sediment is disturbed or other particles are suspended in the water. |
| **vascular plants** | Plants that contain vessels that conduct fluid. |
| **waiora** | The purest form of water – a source of wellbeing and life used for cleansing from sickness and to create positive energy. This water can become waitapu. |
| **wai māori** | Water that runs freely and has no particular sacred associations. Ordinary water. |
| **wai horoi** | Water that is used to bathe in or to wash clothes. |
| **wai inu/wai unu** | Water that is used only for drinking. Drinking water is not taken from a source used for washing unless there is no alternative, when it should be taken at a time when washing or bathing is not permitted. |
| **waikino** | Water that has been corrupted or altered to such an extent that it can cause harm or water that conceals hidden danger. |
| **wai makariri** | Cold water, mainly cold freshwater. |
| **wai piro** | Slow-moving water such as in repo (swamps). These waters provide many resources such as rongoā (medicine), dyes for weaving harakeke, tuna (eels) and homes for many living organisms. |
| **waimate** | Water that has lost its mauri or life force. It is ‘dead’, damaged or polluted with no ability to sustain life. It can contaminate other living or spiritual things. |
| **waitai** | The sea, surf or tide. Used to distinguish seawater from freshwater. |
| **waitapu** | Water with a tapu imposed upon it. Water used for special ritual practices – tohi and pure – baptism and purification ceremonies. Water that has a sanction against most activities – also known as a rāhui. |
| **waipuke** | Flood or floodwater. |
| **water clarity** | A measurement of how clear water is – the distance that objects can be seen through the water. |
| **water velocity** | The speed at which water flows. |