**ACTIVITY: Exploring my local lake**

**Activity idea**

In this activity, students use a combination of online resources to identify and explore lakes in their local area. The activity can be a simple online discovery or it can be expanded to include an in-depth inquiry of a lake, its catchment area, its current state of health and its history.

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

* use an online map to locate lakes
* use online resources to gather and interpret data about the lakes – for example, catchment information and/or water quality
* draw on mātauranga and community stories of how the lakes used to be and explore changes over time
* identify issues of importance and consider actions they may like to take.

**For teachers**

***Introduction/background***

Aotearoa New Zealand has more than 3,800 lakes larger than 1 hectare (about the size of a rugby field). Even though there is an abundance of lakes in Aotearoa, many are tucked away on private land or are remote and difficult to access.

This activity encourages students to identify and explore lakes in their local area.

The activity provides opportunities for:

* local curriculum design
* building knowledge of local mātauranga and concepts like mauri, wairua, wai ora, ki uta ki tai and mahinga kai
* building knowledge of science concepts such as lake origins, catchment areas and water quality.

***Hub resources – background information***

These Hub resources provide background information about lakes in Aotearoa and some key mātauranga and science concepts:

* [The lakes of Aotearoa New Zealand](https://www.sciencelearn.org.nz/resources/3211-the-lakes-of-aotearoa-new-zealand) – general information article about lakes and their origins
* [Waitī – freshwater environments](https://www.sciencelearn.org.nz/resources/3124-waiti-freshwater-environments) – article about the state of our freshwater systems
* [Wai Māori](https://www.sciencelearn.org.nz/image_maps/88-wai-maori) – interactive that curates resources that explore some of the values and connections between iwi and wai
* [Water catchments](https://www.sciencelearn.org.nz/resources/2873-water-catchments) – article and interactive curation of resources
* [Water quality – factors and issues](https://www.sciencelearn.org.nz/resources/2872-water-quality-factors-and-issues) – article and interactive curation of land use impacts

***Online resources – exploring lakes***

These resources are useful for locating lakes. Many provide information about water quality/mauri of the lake, land use in the catchment and accessibility:

* [Google Maps](https://www.google.co.nz/maps/%40-40.6756927%2C173.6740629%2C6.24z) or similar
* [Connecting New Zealanders to Lakes](https://storymaps.arcgis.com/stories/b511804c79d04a8b98381c96b2e7a798) – lake access information
* [Lakes380 sampled lakes](https://lakes380.com/lakes/) – filter for regional information
* [Lakes380 water quality tool](https://lakes380.upshift.co.nz/) – named and unnamed lakes with links for further information
* [Land, Air, Water Aotearoa](https://www.lawa.org.nz/explore-data/lakes/) – information on monitored lakes
* [NZ Topo Maps](https://www.topomap.co.nz/) – information about terrain/catchment and accessibility of lakes

***Teaching suggestions***

There are numerous ways to approach learning about local lakes – depending on whether the objective is to conduct a simple online discovery or a more in-depth inquiry of a lake, its catchment area, its current state of health or its history. The following notes offer suggestions for getting started.

***What to do***

1. Begin with a brainstorm of the freshwater systems in the area. If students confuse local freshwater and marine systems, take the time to discuss each system and sort them into freshwater and marine categories.
2. If appropriate, consider grouping freshwater systems by roto (lake), awa (river) and repo (wetlands).
3. Discuss how/why students are aware of these freshwater systems. What are their personal connections?

1. Use online resources to locate lakes within your area.
* The [Lakes380 water quality tool](https://lakes380.upshift.co.nz/) shows the location of hundreds of named and unnamed lakes across the motu. This site also includes lake water quality information.
* [Lakes380 sampled lakes](https://lakes380.com/lakes/) has filters for regional information.
* The satellite view of [Google Maps](https://www.google.co.nz/maps/%40-40.6756927%2C173.6740629%2C6.24z) is helpful for viewing the land use surrounding the lake – whether it is surrounded by native forest, riparian planting, pasture or urban areas.
* [NZ Topo Maps](https://www.topomap.co.nz/) is helpful for checking public access to the lake.
* Local and/or regional councils and the Department of Conservation may also have information about access to lakes on public land.
* [Land, Air, Water Aotearoa](https://www.lawa.org.nz/explore-data/lakes/) has information about water quality. [Can I swim here?](https://www.lawa.org.nz/explore-data/swimming/) has recreational water quality monitoring programmes from November to March.

1. Engage students’ curiosity about a local lake. Encourage questions such as the following:
* How do you think the lake came to exist – what might be its origin?
* Is it part of a larger freshwater system – ki uta ki tai (mountains to the sea)?
* What is the catchment area around the lake used for?
* What impacts might this have on the lake ecosystem?
* What do you think the catchment looked like a century or more ago? How could you find out?
* Was this area a source of mahinga kai? How could you find out?
* Are we able to visit the lake? Is it open to the public?
* What is the water quality/lake health like? Is it safe to swim there?
* Are there any issues affecting the lake?
* What causes these issues to happen? Where can we find information about the issues?
* Are there actions we can take to improve the health of the lake?

1. Choose one or more ideas that arise from this discussion. Consider where to find local information:
* There may be local news articles or stories that you can utilise for engagement.
* Draw on community mātauranga/knowledge of the area – from local marae or retirement villages – and explore changes over time.
* Local and regional councils can also be good sources of information.

1. If students are interested in exploring environmental issues regarding a local lake, consider using the [Inquiry and action learning process](https://www.sciencelearn.org.nz/image_maps/92-inquiry-and-action-learning-process). Although the process uses rivers as the context for inquiry, the process is transferable to lakes.

***Extension ideas***

The activity [Titiro – observing my environment](https://www.sciencelearn.org.nz/resources/2997-titiro-observing-my-environment) offers observation experiences in an outdoor school setting. Use it to expand student experiences regarding observations or as a practice session before visiting a lake or other natural habitat.

The activity [Ake Ake – forever and ever](https://www.sciencelearn.org.nz/resources/458-ake-ake-forever-and-ever) uses pictorial mapping to represent what students would like the future to look like. The model highlights the values of the past, the issues of maintaining values in the present and also what the future map looks like.