

Appendix 2: POSSIBLE LINKS: NZ CURRICULUM AIMS, OBJECTIVES AND LEARNING CONTEXTS FOR LAKE

Lake	English	The Arts	Health & Physical Education	Learning Languages	Mathematics & Statistics	Science	Social Sciences	Technology	Overarching Principles: Te Marautanga o Aotearoa	Education for Sustainability Principles	Environmental Education Principles	Education Outside the Classroom Principles
Waiora, Waimāori, Waimate, Waitapu	√	√	√	√	√	√	√	√	√	√	√	√
Aquatic Habitats	√	√	√	√	√	√	√	√	√	√	√	√
Living Organisms	√	√	√	√	√	√	√	?	√	√	√	√
Food Webs	√	√	√	√	√	√	√	√	√	√	√	√
Life Cycles	√	√	√	√	√	√	√	√	√	√	√	√
Cultural, Ecological, Economic Aspects	√	√	√	√	√	√	√	√	√	√	√	√
Recreation	√	√	√	√	√	?	√	√	√	√	√	√
Food Source	√	√	√	√	?	√	√	√	√	√	√	√
Native Species: Eels	√	√	√	√	√	√	√	√	√	√	√	√
The Eel Pass & Implications	√	√	√	√	√	√	√	√	√	√	√	√
Introduced Species: Grass Carp	√	√	√	√	√	√	√	√	√	√	√	√
Pest Species & Threats	√	√	√	√	√	√	√	√	√	√	√	√
Human Impact & Mitigation	√	√	√	√	√	√	√	√	√	√	√	√
Iwi & Treaty of Waitangi	√	√	√	√	√	√	√	√	√	√	√	√
Kaitiakitanga	√	√	√	√	√	√	√	√	√	√	√	√
Healthy Ecosystems & Biodiversity	√	√	√	√	√	√	√	√	√	√	√	√

Note:

The above chart demonstrates that learning links identified around the physical learning context LAKE can be readily associated with NZ Curriculum aims and objectives across the range of subject areas. Naturally enough, not *all* the aims and objectives of every curriculum area can be covered by focusing on a single learning link. The chart simply exists to demonstrate the broad scope of subjects which can be taught within a learning link topic and to encourage teachers to look beyond the most obvious curriculum connections when planning programmes with their learners. The question marks are a challenge for more creative teachers; there may well be connections between these learning links and the educational aims and objectives in the given subject areas; see if you can find some! For more detailed information, please refer to the individual curriculum subject area documents, available through the TKI website.

Examples of Links to NZ Curriculum Documents

English

Any of the above topics could potentially be linked to the two interconnecting strands around which the teaching and learning of English is structured within the NZ Curriculum:

- Students making meaning of ideas or information they receive (listening, reading and viewing)
- Students creating meaning for themselves or others (speaking, writing and presenting)

Below are specific examples of how three of the above topics could link with English Curriculum Achievement Aims.

Listening, Reading & Viewing: Ideas & Indicators (Level 4→) eg: when researching texts for information as in: *Native Species: Eels*

Speaking, Writing & Presenting: Structure eg: when responding to experiences & learning as in: *_Waiora, Waimāori, Waimate, Waitapu*
eg: when communicating ideas as in: *Human Impact & Mitigation*

The Arts

Any of the above topics could potentially be linked to The Arts Curriculum Achievement Aims.

Below are two examples of this:

Drama: Developing Ideas (Level 2→) Develop and sustain ideas in drama, based on personal experience and imagination eg: responding to learning about *The Eel Pass & Implications* by communicating their new learning through drama

Visual Arts: Communicating & Interpreting (Level 2→) Share the ideas, feelings & stories communicated by their own and others' objects and images, eg: Interpreting concepts around *Life Cycles* using visual art , discussing their work and responding to the work of others.

Health & Physical Education

Any of the above topics could potentially be linked to the four underlying and interdependent concepts at the heart of the Health & Physical Education Curriculum.

Below are examples of this:

Hauora: A Maori philosophy of well-being that includes the dimensions taha wairua, taha hinengaro, taha tinana and taha whānau, each one influencing and supporting the others eg: exploring these dimensions within the environmental context *Human Impact & Mitigation*, the Lake environment as a traditional *Food Source*

Attitudes & Values: A positive, responsible attitude on the part of students to their own wellbeing: respect, care and concern for other people and the environment and a sense of social justice eg: *Kaitiakitanga*

The Socio-Ecological Perspective: A way of viewing and understanding the interrelationships that exist between the individual, others and society eg: *Cultural, Ecological & Economic Aspects*

Health Promotion: A process that helps to develop and maintain supportive physical and emotional environments and that involves students in personal and collective action eg: *Recreation*

Learning Languages

Any of the above topics could potentially be linked to the three interconnecting strands that make up the framework for teaching and learning languages: the core **communication** strand and the supporting strands **language knowledge** and **cultural knowledge**.

Below is an example of how one of the above topics could be linked to achievement objectives in the Learning Languages Curriculum:

Communication: Proficiency Descriptor – (Level 5→) students can understand and produce more complex language. They can communicate beyond the immediate context; for example, about past and future events. Students can understand and produce a variety of text types eg: using Māori language and terminology in discussion as part of a wider study around *Iwi & Treaty of Waitangi* issues

Mathematics & Statistics

Most of the above topics could easily be linked to the three interconnecting strands **number and algebra**, **geometry and measurement** and **statistics** that make up the framework for teaching and learning mathematics and statistics. With a bit of creative planning, those topics with question marks beside them could also be linked in to Mathematics and Statistics Curriculum Objectives.

Below are specific examples of how three of the above topics could be linked to Mathematics and Statistics Curriculum Objectives:

Statistics: Statistical investigation (Level 1→) Conduct investigations using the statistical enquiry cycle eg: undertaking a tracking tunnel survey to determine pest species present. Recording the resulting data and interpreting the results as part of a study of *Pest Species and Threats*

Geometry and Measurement: (Level 3→) Use linear scales and whole numbers of metric units for temperature eg: when gathering data and comparing water temperature eg: in various different *Aquatic Habitats*

Probability: (Level 3→) Investigate simple situations that involve elements of chance by comparing experimental results with expectations from models of all the outcomes, acknowledging that samples vary eg: when investigating the relationship between water temperatures in the above study of *Aquatic Habitats* and the type of creatures or *Living Organisms* living in those particular habitats

Science

Most of the above topics could easily be linked to the core strand **Nature of Science** and one or more of the related strands; **Living World, Planet Earth & Beyond, Physical World** and **Material World** that make up the framework for teaching and learning in the New Zealand Science Curriculum.

Below are examples of this:

Nature of Science: Communicating in Science (Levels 1&2) Students develop knowledge of the vocabulary, numeric and symbol systems and conventions of science and use this knowledge to communicate about their own and others' ideas, eg: when examining *Healthy Ecosystems & Biodiversity* and constructing *Food Webs* to show interrelationships.

Living World: Ecology (Level 3→) Students explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human-induced, eg: when investigating the themes *Aquatic Habitats, Living Organisms* and *Human Impact & Mitigation*

Social Sciences

Any of the above topics could potentially be linked to one or more of the four conceptual strands that make up the framework for teaching and learning Social Sciences from Levels 1→5 within the NZ Curriculum: **Identity, Culture & Organisation, Place & Environment, Continuity & Change, The Economic World**. They would be equally compatible with the more specialist subject strands of Social Sciences taught from Levels 6→8

Examples are below:

Social Studies: (Level 2→) Understand that people have social, economic and cultural roles, rights and responsibilities, Understand how cultural practices reflect and express people's customs, traditions and values, Understand how places influence people and people influence places eg: when exploring learning links such as *Cultural, Ecological & Economic Aspects, Kaitiakitanga, Human Impact & Mitigation, Introduced Species: Grass Carp*

Social Studies: (Level 2→) Understand how the status of Māori as tangata whenua is significant for communities in New Zealand eg: in discussing local issues such as the recent Maungaharuru Tangitu Treaty Settlement, under the learning link *Iwi & Treaty of Waitangi*

Technology

Most of the above topics could easily be linked to the three interconnecting strands **technological practice, technological knowledge** and **nature of technology** that make up the NZ Curriculum framework for teaching and learning Technology.

Below are some examples:

Technological Practice: Outcome Development and Evaluation (Level 1→) Investigate a context to communicate potential outcomes. Evaluate these against attributes; select and develop an outcome in keeping with the identified attributes, eg: learning links such as *Pest Species & Threats*: undertaking a tracking tunnel survey to determine pest species present, then choosing and employing an appropriate method of pest control based on findings

Nature of Technology: Characteristics of Technological Outcomes (Level 2→) Understand that technological outcomes are developed through technological practice and have related physical and functional natures. Characteristics of Technology (Level 3→) Understand how society and environments impact on and are influenced by technology in historical and contemporary contexts and that technological knowledge is validated by successful function eg: through investigations about how human activity has impacted on the long finned eels' journey from inland waterways out into the ocean and how humans can mitigate this: learning links *Native Species: Eels, The Eel Pass & Implications, Life Cycles* and *Human Impact & Mitigation*

Note:

In addition to demonstrating associations between the learning links identified and NZ Curriculum aims and objectives, the above chart also shows that learning programmes could easily be developed from these links which are compatible with the overarching principles of Te Marautanga o Aotearoa, Education for Sustainability, Environmental Education and Education Outside the Classroom. Again, not *all* the overarching principles of these focus areas can be covered by concentrating on a single learning link. The chart simply demonstrates the broad scope of principles which can be taught within a learning link topic. The aim is to support and encourage teachers to consciously incorporate these principles in their teaching across the various subject areas, to create full and valuable learning experiences engaging the widest possible range of learners. In the examples below, one objective has been selected for each principle, for demonstration purposes. For more detailed information, please refer to the individual documents, available through the TKI website.

Examples of Links to Overarching Principles:

Te Marautanga o Aotearoa

The Learner is the Centre of Teaching and Learning: The school based curriculum will: provide experiences that enable learners to reach their potential across each learning area, eg: as when studying *Aquatic Habitats* outdoors in the relevant context of that environment, with the programme being built around readily assessable aims and objectives from the wider school curriculum which are appropriate to the needs of learners

The Learner has a High Level of Personal Awareness: The school based curriculum will: help learners to be successful in the Māori world and the wider world, eg: as when relating concepts such as *Waiora, Waimāori, Waimate, Waitapu*; to local waterways during environmental investigations and making links between Māori and other cultural perspectives of the environment.

The Learner Achieves Their Potential: Experiences should be provided which: Engage the Learner eg: relevant, hands on educational activities, such as planning and preparing for *Recreation* activities to be undertaken during their school camp, perhaps creating their own RAMS and comparing these with the existing ones.

School, Whānau, Hapū, Iwi and Community Will Work Together: The school based curriculum should: include experiences outside of the school which are relevant to the whānau and community, eg: as part of a study on *Healthy Ecosystems & Biodiversity*, working with agencies such as the Regional Council and local marae to hold a community planting day with the objective of enhancing and revitalising a section of a local stream. Researching and incorporating desirable species of weaving flax into the plantings, with the aim of sustainably harvesting this in future to use for community projects.

Environmental Health is Personal Health: The school based curriculum supports: A sustainable environment, eg: as a school, setting environmentally sustainable standards in the school Charter and actively practising principles such as *Kaitiakitanga* in day to day school life. Enabling and encouraging students to continue these sustainable living habits at home

Note:

The current curriculum documents for Education for Sustainability and Environmental Education are the *New Zealand Curriculum, Te Marautanga o Aotearoa* and the *Education for Sustainability Teaching and Learning Guidelines (years 11 – 13)*. Education for Sustainability sits within the wider curriculum area *Social Sciences*. These curriculum documents are informed by the *Guidelines for Environmental Education in New Zealand Schools*, published 1999 for the Ministry of Education.

The current curriculum document to support Education Outside the Classroom (EOTC) is *EOTC Guidelines – Bringing the Curriculum Alive*, published 2009 for the Ministry of Education. For further information, please refer directly to the individual documents, available online through the TKI website.

Education for Sustainability

The exploration of attitudes, values and behaviours with respect to the environment – both our own and those of others, are central principles of Education for Sustainability

Education for Sustainability (Efs) includes learning about:

- The environment – water, land, ecosystems, energy, waste, urban living, transportation eg: as in *Healthy Ecosystems & Biodiversity, Aquatic Habitats*
- The interactions between the natural environment and human activities and the consequences of these eg: as in *Cultural, Ecological & Economic Aspects*
- The choices and actions we can take to prevent, reduce or change harmful activities to the environment eg: as in *Human Impact & Mitigation*

Key concepts that students can develop understanding of through Education for Sustainability include:

- **Sustainability** – individuals, groups and society as a whole adopting ways of thinking and patterns of behaviour that will enable them to meet their needs and aspirations without compromising the ability of future generations to meet theirs
- **Equity** – respect for all life, social justice, intergenerational equity, finite resources
- **Interdependence** – biodiversity, community, cultural diversity, democracy, globalisation
- **Responsibility for action** – taking action, informed decision making, citizenship, consumerism, enterprise, resilience and regeneration.

These key concepts can be readily developed through learning contexts such as those identified in the above chart.

Environmental Education

Environmental Education is described in *Guidelines for Environmental Education in New Zealand Schools* as:

“a multi-disciplinary approach to learning that develops the knowledge, awareness, attitudes, values and skills that will enable individuals and the community to contribute towards maintaining and improving the quality of the environment”

Environmental Education involves the integration of three key dimensions:

- Education **in** the Environment
- Education **about** the Environment
- Education **for** the Environment

A balanced Environmental Education Programme addresses all three of these dimensions.

The Aims of Environmental Education are for students to develop:

- **Awareness and Sensitivity** to the environment and related issues; eg: when exploring *Cultural, Ecological & Economic Aspects*
- **Knowledge and Understanding of the environment and the impact of people on it**; eg: when learning about *Human Impact & Mitigation*
- **Attitudes and Values** that reflect feelings of concern for the environment; eg: as in *Kaitiakitanga*
- **Skills** involved in identifying, investigating and problem solving associated with environmental issues; eg: as in students identifying a problem with rats/mustelids/possums preying on birds in the school bush, monitoring and collecting data using tracking tunnels, deciding on the best control method, then implementing this and monitoring their success rate, as in *Pest Species & Threats* (in, about and for the environment)
- A sense of responsibility through **participation and action** as individuals, or members of groups, whānau or iwi , in addressing environmental issues eg: students identifying a need for riparian planting to help regenerate a section of a local waterway, enlisting community help and sponsorship to build a shade house at school, approaching the regional council for assistance in sourcing seedlings which their student “green team” can then grow-on, organising a community planting day and coordinating a class roster for regular maintenance of the new planting as an action to promote *Healthy Ecosystems & Biodiversity* (in, about and for the environment)

Multidisciplinary, holistic teaching and learning approaches are particularly appropriate for meeting the aims of environmental education when dealing with the often complex issues related to a sustainable future.

Education Outside the Classroom

Education Outside the Classroom supports the vision, principles, values, key competencies and learning areas in the New Zealand Curriculum. The principles of Education Outside the Classroom (EOTC) support safe and effective curriculum-based teaching and learning that extends beyond the classroom walls, encouraging engagement and connection with the wider environment. EOTC can provide opportunities for students to develop skills and self confidence and to strengthen understanding of their own and others' values and attitudes through participating in shared experiences. Good EOTC programmes can help students develop attributes such as responsibility, trust, independence and the ability to work cooperatively. Quality learning can take place anywhere, making it relevant, fun and accessible to all students, regardless of their individual circumstances.

Below are some examples of ways in which EOTC enables students to develop, practise and demonstrate the five key competencies within and across learning areas:

- By providing authentic **contexts** for students to develop and demonstrate their capabilities eg: students “thinking” when learning about the environment, **in** the environment, such as a field trip to a local waterway, assessing the habitat health by investigating the level of biodiversity present, as in *Aquatic Habitats, Healthy Ecosystems & Biodiversity*
- By providing opportunities for students to **apply** the key competencies and use them to **transform learning** eg: students “participating and contributing”; viewing the Pan Pac Kiwi Crèche eels and eel pass at Lake Opouahi, relating this to students’ classroom learning about long finned eels and their life cycle habits, discussing the human impact challenges which eels face in completing their life cycle, then planning and implementing a mitigation measure to help eels locally; as in *Native Species: Eels , The Eel Pass & Implications, Life Cycles and Human Impact & Mitigation*
- By providing opportunities for students to develop the **disposition** to use the key competencies eg: students practising “managing self” through participating in new experiences, such as kayaking on Lake Opouahi during a school camp; *Recreation*
- By providing opportunities to reinforce the **future focused** aspects of the key competencies through experiences in which students encounter issues with relevance to their future beyond school eg: students “relating to others” through participating in a field trip to a local waterway with community agencies such as DOC or Local Iwi to look at and discuss issues such as promoting the ongoing sustainability of local whitebait fisheries and the issues surrounding this, as in *Cultural, Ecological & Economic Aspects*