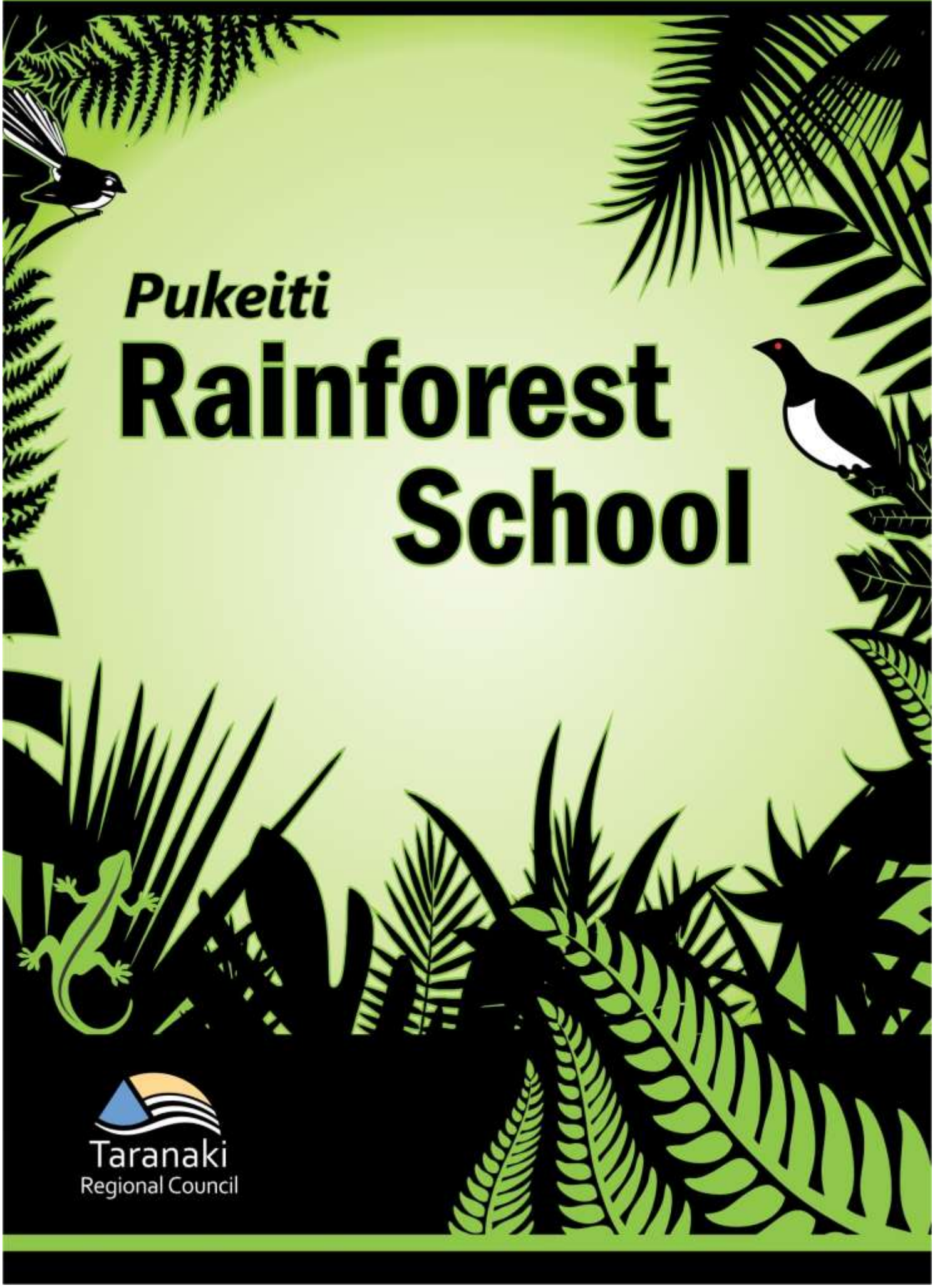
STUDY UNIT



Pukeiti
Rainforest School

Taranaki
Regional Council

Rainforest School

This study unit outlines the activities available for teachers to choose from when visiting the Pukeiti Rainforest School with their classes.

Considerable overseas research has proved that children who spend time learning in natural environments perform better in reading, mathematics, science and social studies. The research also revealed that students who have been involved in activities that explore the natural world often take a more positive view towards other school subjects. This can result in previously apathetic students becoming excited and motivated about their learning.

2013 was very much a trial year for hosting school groups to Pukeiti Gardens. Our thanks go to the teachers and students of the 25 school groups that visited during the year. This study unit has been written using much of the valuable feedback we received from the teachers, students and accompanying adults.

Feedback told us that our programmes :

- are highly motivating
- provide hands-on experience
- provide a meaningful context for students to explore concepts such as sustainability and conservation
- provide opportunities to develop key competencies, essential skills and values
- involve a range of learning areas in the NZ curriculum
- inspire students to 'make a difference' in their own environment, whether that be at home, at school or in their local community.

Teachers should choose activities appropriate to their students' class levels although there is some flexibility available with all activities. The unit can be downloaded from the Taranaki Regional Council website www.trc.govt.nz which is also a source for research to assist with some of the activities.

Pukeiti Rainforest School – nurturing the seedlings of our future.

General Information for school visits to the Pukeiti Rainforest School.

- **Hours:** School visits are held between 10.00am and 2.00pm.The one exception is the night - time observation of native freshwater fish in their natural habitat. These visits which will start at varying times during the year but no earlier than 5.00pm and finishing no later than 9.00pm.
- **Cost:** Entry to Pukeiti is free to all visitors.
- **Adult:Student ratio**: The Council's policy is 1 to 5 adult:student ratio for all Council-led field trips, including those to our regional gardens. Some flexibility can be used with high school groups.
- **Group numbers:** All activities are designed for groups of less than 35 students plus adults and teachers.
- **Risk Analysis Management (RAM) sheets**: These must be sent by email or fax to the Council's Education Officer before the day of the visit. Email kevin.archer@trc.govt.nz or fax 06 765 5097
- **Names**: A list of all the names of students/teachers and accompanying adults present must be given to Kevin Archer or the resource person hosting the group at the start of the visit.
- **Road Access**: Extreme care is required when driving to and from Pukeiti. While the road has been improved in recent years, it is still winding and narrow in places.
- **Months available**: School visits are welcome at any time of the school year. However some activities may not be available during October and early November.
- **Programme rotation**: Depending on the activities chosen, it is possible for groups to cover up to four activities in one visit, as some activities can be easily combined with others.
- **Walks**: it is recommended to include at least one of the two walks available as part of the intended programme.
- **Times:** The times suggested in the activities are approximate only and can be adjusted to meet the needs of the students.
- **Activity levels**: Each activity has a suggested class level range but many can be adjusted to meet all levels.
- **Morning tea and lunch**: Teachers need to factor in short breaks for morning tea and lunch during the visit. All visitors need to provide their own morning tea and lunch.
- **Bookings**: It is suggested that bookings be made months in advance to avoid disappointment. For initial enquiries please contact: Kevin Archer Ph 06 765 7127 or email: kevin.archer@trc.govt.nz
- **Cancellations**: As this is a rainforest area, cancellations are unlikely, unless conditions are likely to become extremely unpleasant or unsafe.
- **Clothing:** Students should bring raincoats, old shoes, hats etc for all visits. Sunblock is recommended in the warmer months.
- **Resources:** All resources required for any activity are provided by the Taranaki Regional Council.

Activities

Activity 1 Rainforest walk

Duration: 45-60 minutes
Resource person: Kevin Archer
Suitable for all year levels.

Lesson description

This walk is not difficult for students of an average fitness level. There are several stops along the way where the students learn about many aspects of Pukeiti and its history. The walk takes in parts of several of the named bush walks. Students will learn how to identify many New Zealand native trees and hear lots of information about them, in particular the rimu and its importance in Pukeiti's early history. Students will get the opportunity to venture inside a giant rata and to exit via a secret passage.

Learning Areas

Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*

Students will learn about:

- the structure and layers of the rainforest.
- some exotic and native plant adaptations.
- names of and interesting facts about many of our native trees.
- the history of Pukeiti, in brief.
- the early logging industry, in brief.

Keywords:
ecosystem, rainforest, adaptations, exotics, natives, biodiversity

Points of interest

- Canopy layers and edge effect.
- Giant Himalayan lily and giant rata.
- Hauler trench.
- Adaptations – widow makers, large leaf rhododendrons, plant growth changes etc.

Key competencies K
Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills E
Communication
Information gathering
Problem solving
Self-management
Physical
Work and study

Values V
Excellence
Innovation
Community and participation
Respect

Activity 2 Wonderful Waterwheel and Vireya Walk

Duration: 30 - 40 minutes
Resource person: Kevin Archer
Suitable for younger classes.

Lesson description

This walk is particularly suitable for younger students or as an alternative to the **Rainforest Walk** if there is inclement weather conditions or insufficient time.
It provides an opportunity to see some of the weird and wonderful plants in the covered Vireya walk and to discover and learn about the historic waterwheel.

Learning areas

Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*

Students will learn:

- interesting facts and figures about several of the plants living inside and outside of the Vireya Walk.
- about the history of the waterwheel and its current functions.

Keywords:
colours, texture, leaf and flower shapes, native, exotic, deciduous renewable energy

Points of interest

- Interesting plants in the Vireya Walk.
- The waterwheel.

Key competencies K
Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills E
Communication
Information gathering
Self-management
Physical
Work and study

Values V
Community and participation
Respect

Activity 3 Terrific Trees and the Bush Canopy

Duration: One hour
Resource Person: Kevin Archer
More suitable for higher primary, intermediate and high school classes.

Lesson description

This activity involves studying 12 New Zealand native trees, with each student having access to a hand-held mini-booklet to assist with tree identification. It also includes an activity that requires close observation of the plants and trees that live in the rainforest, from the tiny seedlings on the forest floor, up to the tall trees that form the bush canopy. Several vantage points are used, including one from ground level and another from one of the new tree huts.

Learning areas

***Science**: Living World – Life Processes, Ecology, Evolution*
***Science**: Planet Earth and Beyond – Interacting cycles*
***Social Science**: Place and Environment, Continuity and Change*
***Mathematics and Statistics**: Geometry and Measurement, Number Strategies*

Students will learn that:

- many of NZ's native trees have their own special characteristics and identifying features.

Keywords:
estimation, hand-shaped, alternating, opposite, teeth, lobed, gnarled, native, exotic

Points of Interest

- Native trees such as kauri, rimu, pukatea, houhere, mahoe, horopito, lancewood, kowhai, miro, tawa, kotukutuku and giant rata.
- Four new tree huts.

Key competencies K
Managing self
Relating to others
Participating and contributing

Essential Skills E
Communication
Information gathering
Problem solving
Physical
Work and study

Values V
Innovation
Respect

Activity 4 Flowers and Rhododendrons

Duration: One hour
Resource Person: One of the Pukeiti gardeners and/or Kevin Archer.
Suitable for higher primary, intermediate and high school groups.

Lesson description

This activity is primarily a seed sowing activity with the type of seed dependent on the time of the year.

Keywords:
germination, seed dispersal, seed sowing, flower parts, pollination

Learning areas

***Science**: Living World – Life Processes, Ecology, Evolution*
***Social Science**: Place and Environment, Continuity and Change*
***Mathematics and Statistics** - Probability*

Students will learn about:

- the parts and functions of a flower.
- plant adaptations required to ensure pollination.
- the different methods of seed dispersal.
- how to sow seeds.

Points of Interest

- Plants in seed
- Vireya Walk
- Potting shed

Key competencies

Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills

Communication
Information gathering
Problem solving
Work and study

Values

Excellence
Innovation
Community and participation
Respect

Activity 5 The Pukeiti Garden Rally

Duration: One hour 15 minutes
Resource Person: Kevin Archer
Suitable for small groups of intermediate and high school students.

Lesson description

This activity is based on the same principles as a car rally. Students will be placed in groups of three or four, each group basically receives the same set of instructions, some simple and some more complex. Groups use the clues to locate, photograph, sketch or make notes on a particular Pukeiti feature. The groups will start at three minute intervals and each group is given 45 minutes to complete the course. To save time there will be two separate courses each covering the same features but starting at different points. This will mean that there will be two groups starting together but heading off on different courses but covering the same areas.

Keywords:
teamwork, co-operation, compromise

Learning areas

***Health and Physical Education**: Safety management, positive attitudes, challenges, relationships, interpersonal skills*
***Science**: Living World – Life Processes, Ecology, Evolution*
***Social Science**: Place and Environment, Continuity and Change*
***Mathematics and Statistics**: Number strategies and knowledge.*
***Technology**: Technological Practice, Technological Knowledge*

Students will learn how to:

- interpret clues, by carefully reading and analyzing them, before deciding on their probable meanings.
- locate, photograph, take notes or sketch various features of Pukeiti.
- work in small groups effectively under pressure of time.

Points of Interest

- All buildings
- Covered exhibition way
- Prominent native trees
- Hauler trench
- Waterwheel
- Maori carving
- Field
- First rhododendron to flower

Key competencies
Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills
Communication
Information gathering
Problem solving
Self-management
Physical
Work and study

Values
Excellence
Innovation
Community and participation
Respect

Activity 6 Native Freshwater Fish

Duration: 30 minutes
Resource Person: Kevin Archer
This activity is suitable for all levels.

Lesson description

This is an opportunity for students to observe several species of New Zealand's native freshwater fish in our aquarium. They will learn why so little is known about many of them; why some species are endangered, one is extinct, and how human impacts on the environment have contributed to the falling numbers. They will learn about some of the measures being taken to improve the situation to give all species a better chance of survival.

Learning areas:

***Science**: Living World – Life Processes, Ecology, Evolution*
***Social Science**: Place and Environment, Continuity and Change*

Students will learn that:

- we have 34 known native freshwater fish in our lakes, streams and rivers, 18 of which can be found in Taranaki.
- one species, the grayling, is now extinct and at least 10 other species are endangered.
- most native freshwater fish are small, secretive, nocturnal and often live in solo situations.
- migratory patterns of many of our freshwater fish involve long journeys to and from the sea.
- Negative human impacts on natural habitats have been severe and rapid in NZ.
- riparian management programmes will enhance the prospects of survival of many species.

Resources
fish tanks, display boards, information sheets

Key competencies
Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills
Communication
Information gathering
Work and study

Values
Excellence
Innovation
Community and participation
Respect

Activity 6

Native Freshwater Fish

Keywords:
camouflage, solitary, migration patterns, exploitation, introduced, species, nocturnal, fauna, marine wanderers, distribution, habitat, conservation

Above: *NZ Native Koura* Freshwater Crayfish

Right: Brown Trout *(juvenile)*

Left: Redfin Bully

Below: *Koara*

Activity 7 Native Freshwater Fish and their Natural Habitat at Night.

Duration: One hour 30 minutes.
Resource personnel: Kevin Archer and Nathan Hills.
Suitable for small groups of students from Year 5 and higher.

Lesson description

This activity involves all of Activity 6 (Native freshwater fish) followed by a practical opportunity to observe some native freshwater fish in their natural habitat. Owing to the secretive nature of many of the species under observation, this is not a suitable activity for groups of more than 12. Starting and ending times will vary according to the month of the year but we envisage a starting time to be no earlier than 5.00pm and a finishing time of no later than 9.00pm. Torches and extra warm clothing are essential.

Learning areas

Health and Physical Education: *Safety management, positive attitudes, challenges, interpersonal skills*
Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*

Students will learn that:

- we have 34 known native freshwater fish in our rivers, 18 of which can be found in Taranaki rivers and streams.
- one species, the grayling, is now extinct and at least 10 other species are endangered.
- most native freshwater fish are small, secretive, nocturnal and often live in solo situations.
- migratory patterns of many of our freshwater fish involve long journeys to and from the sea.
- human impacts on natural habitats have been severe and rapid in NZ.
- riparian management programmes will enhance the prospects of survival of many species.

Keywords:
camouflage, solitary, migration patterns, exploitation, introduced, species, nocturnal, observation, fauna, marine wanderers, distribution, habitat, conservation

Points of interest

- Freshwater native fish tanks
- Puketewhiti stream

Key competencies K
Managing self
Participating and contributing

Essential Skills E
Communication
Information gathering
Self-management
Physical
Work and study

Values V
Excellence
Innovation
Community and participation
Respect

Activity 8 Creepy Crawlies

Duration: One hour 20 minutes
Resource Person: Kevin Archer
This activity is suitable for all year levels.

Lesson description

This activity involves an indoor session which covers creepy crawlies, insects and arachnids in general terms, followed by an outdoor practical exercise to observe and identify some of them in identification trays. The students will be actively involved throughout, with several observational activities and up to three fun games designed to further enhance their learning.

Learning Areas

Health and Physical Education: *positive attitudes, challenges, interpersonal skills*
Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*

Students will learn:

- about the different groups of creepy crawlies and their role in the overall ecosystem.
- why scientists don't like the term 'creepy crawlies'.
- some amazing facts about all sorts of creepy crawlies.
- how to use pitfall traps to discover creepy crawlies.
- how to build a simple weta motel.
- how to play some simple games based on insects' behaviour.

Keywords:
classification, carnivore, herbivore, omnivore, habitat, decomposers, insects, spiders, arthropods, creepy crawlies

Resources
Photos, insect charts, terrarium, pinned insect collection, plastic insects, models, bamboo bars, trays and ID charts, clipboards, pencils

Points of Interest

- Natural insect holes in large trees along the Cook Walk.
- Pitfall traps (set on Larcom Walk).
- Home-made weta motels.
- Weta boxes

Key competencies (K)
Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills (E)
Communication
Information gathering
Problem solving
Self-management
Physical
Work and study

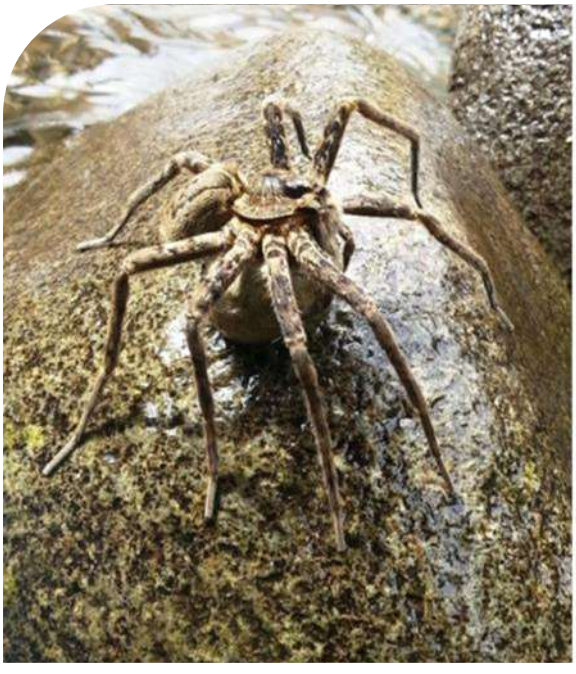
Values (V)
Excellence
Innovation
Community and participation
Respect

Top left: Do you recognise which creature this empty shell belongs to?

Left: Pukeiti is buzzing with life!

Above: Look out for Weta boxes at Pukeiti and see who lives inside

Below: Water spider carrying an egg sac



Activity 9 Pot a Plant at Pukeiti

Duration: 30 minutes
Resource Personnel: Kevin Archer and at least one of the Pukeiti gardeners.
This activity is suitable for all levels.

Lesson description

This activity is usually incorporated into one of the walks but can be a stand-alone activity. The students will be given guidance to identify and retrieve a native seedling from the side of the track, how to correctly pot it, how and when to replant it and how to care for it in the future.

Learning areas

Health and Physical Education: *Safety management, positive attitudes, challenges, interpersonal skills*
Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*
Technology: *Technological Practice, Technological Knowledge*

Students will learn:

- how to transplant and pot up plants.
- how to care for the plants when they are taken home or back to school.
- about the rainforest in general.
- the plants' names (Maori, common and in some cases Latin).
- the plants uses for humans or as part of the ecosystem.
- how to identify certain native seedlings.
- about what plants need to survive in the rainforest environment.
- about the different parts plants need to survive

Keywords:
native, transplant, care and use, names, endemic

Points of Interest
The forest margins, the potting shed and natural germination on tracks.

Key competencies
Thinking
Managing self
Participating and contributing

Essential Skills
Communication
Information gathering
Problem solving
Self-management
Physical
Work and study

Values
Excellence
Innovation
Community and participation
Respect

Activity 10 Strange Plant Adaptations

Duration:40 minutes
Resource person: Kevin Archer
This activity is more suitable for intermediate and high school groups

Lesson description

This activity examines how some plants, in order to survive, have adapted to various environmental conditions. The first part of the lesson will be indoors, looking at some plant adaptations in NZ and worldwide and the second half will be looking at some of the plant adaptations in our rainforest.

Learning areas

Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*

Points of Interest

- Covered way
- Lancewood *(pictured)*
- Kowhai
- Leatherwood
- Ti Kouka
- Horopito

Right: Juvenile and adult Lancewood foliage.

Students will learn:

- about adaptations such as plants being carnivorous, plants that 'resurrect' themselves, plants that mimic animals, and plants that are deliberately smelly.
- that epiphytes do not have ground roots but by growing closer to the forest canopy they have the advantage of more light.
- that although epiphytes grow in or on other trees, generally they are not harmful to the host.
- that epiphytes need to store water for themselves to prevent desiccation.
- that certain plants such as horopito have a bitter taste, making them unpalatable for eating by birds or animals.
- about the process botanists call 'heteroblasty'. This is where plants such as the lancewood (horoeka) change their stem and leaf structure as they develop from a seedling to an adult plant.
- that some plants are able to get their water requirements through the air.
- that some plants adapt to living in alpine areas by developing their own internal 'anti-freeze' system to ensure survival.

Key competencies
Managing self
Participating and contributing

Essential Skills
Information gathering
Problem solving
Self-management
Work and study

Values
Excellence
Innovation
Respect

Activity 11 Bird Adaptations and the Birds of Pukeiti

Duration: One hour
Resource Personnel: Nathan Hills and Kevin Archer
This activity can be easily adapted to suit any year level.

Keywords:
formation, flight, feathers, migration, extinction

Lesson description

The first part of this lesson will be indoors looking at birds in general, why some NZ species are now extinct or endangered and playing some simple bird-related games. The second part is an observation activity in two parts using our eyes and ears in particular.

Learning areas

Health and Physical Education: *Safety management, positive attitudes, challenges, interpersonal skills*
Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*
Technology: *Technological Practice, Technological Knowledge*

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Students will learn:

- how and why some birds fly and some do not.
- why and how some birds migrate to other parts of the world twice every year.
- how to recognize by sight a selection of New Zealand native birds.
- to recognize some birds by the sounds they make or the way they fly.

Points of Interest

- Several bush areas and clearings.
- One or more of the tree huts.

Photo: Peter Langlands

Native New Zealand birds:
Kereru - wood pigeon (above) and
Piwakawaka – Fantail (left)

Key competencies
Thinking
Managing self
Participating and contributing

Essential Skills
Communication
Information gathering
Problem solving
Self-management
Physical
Work and study

Values
Respect
Community and participation

Activity 12 Encounter the Mystery

Duration: 30 minutes
Resource person: Kevin Archer
This activity is suitable for higher primary, intermediate and high school groups.

Lesson description

This indoor lesson is designed to give students an appreciation of the people and processes that make Pukeiti such a special place. The lesson will acknowledge the valued and dedicated efforts of many 'Pukeiti' people, from the days of the bushmen pioneers, through to the sterling efforts of a small army of Pukeiti Trust volunteers and to the work of the Taranaki Regional Council's team of gardeners.

Keywords:
volunteers, conservation. biodiversity, pioneers, Pukeiti Trust, dedication, vision

Learning areas

Science: *Living World – Life Processes, Ecology, Evolution*
Social Science: *Place and Environment, Continuity and Change*
Health and Physical Education: *People and the Environment, Community resources*

Students will learn:

- about some aspects of the history of Pukeiti.
- a little about the pioneers of Pukeiti.
- just what it is that makes Pukeiti such a special place.
- about the concepts of conservation and biodiversity.
- about the functions of the Taranaki Regional Council.
- about the Council's other two regional gardens – Tupare and Hollard Gardens.

Points of Interest

- Main buildings
- the kauri tree at the entrance
- the rimu
- the Maori carvings

Key competencies
Thinking

Essential Skills
Communication
Information gathering
Work and study

Values
Excellence
Innovation
Community and participation
Respect

Activity 13 Pioneer Bushmen Camp

Duration: 45 minutes
Resource people: Andrew Brooker and/or Kevin Archer
This lesson is suited to all levels.

Lesson description

This lesson examines the lives of the pioneer bushmen and their families, the hardships they had to endure, where they lived and how they used the resources available to them to earn a living and survive in often harsh conditions. At certain times of the year (mainly in term one) students will be able to experience a typical bushman family tent, sited in a typical bush clearing and see for themselves some of the living conditions the bushmen families had to cope with.

Keywords:
pioneer, bushmen, communal living, hardship, lifestyle, no-frills, resourceful,

Learning areas

Social Science: *Identity, Culture and Organisation, Place and Environment, Continuity and Change*
Health and Physical Education: *Relationships with Other People, Rights, Responsibilities and Laws: People and the Environment, Living World – Life Processes*
Health and Physical Education: *People and the Environment, Community Resources*

Students will learn that:

- up to 35 families lived in close quarters in the Pukeiti bush area for many years.
- all family members had important roles to play, to ensure that each family functioned as effectively as possible.
- working and living conditions varied but were often extremely difficult with long hours and extreme weather conditions being a fact of life.
- all family members knew how to survive in the bush, what plants, berries etc were safe to eat and what was not, how to deal with sickness and injuries and how to learn from each other.
- families lived a nomadic lifestyle, often living close to areas that were being logged and moving to new areas when the logging was finished.
- the rimu was the wood of choice, much of it being used for house building in Taranaki, in other parts of New Zealand and even as far away as San Francisco in the USA.

Resources
Photos, exhibits, stories, bushman tent

Points of Interest

- Bush clearings
- Hauler trench
- Bushman tent (in term 1)
- Rimu trees
- Main buildings

Above: a typical bushman's tent provided very basic shelter for the early pioneers
Below: Present day view of Pukeiti main lawn and buildings

Key competencies
Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills
Communication
Information gathering
Problem solving
Self-management
Work and study

Values
Excellence
Innovation
Community and participation
Respect

Activity 14 Puketewhiti Stream Study

Duration: One hour 15 minutes.
Resource person: Kevin Archer.
This activity is suited for Years 4 and above.

Keywords:
invertebrates, Macro Invertebrate Community Index (MCI), mayflies, stoneflies, caddisflies, dobsonflies, molluscs, true flies, worms, thermometer, clarity tube, indicators, sensitivity, source, measurement.

Lesson description

The stream study uses the Puketewhiti Stream as a typical stream close to the National Park. The study involves checking water temperature and clarity plus making an assessment of the water quality using aquatic invertebrates. Schools can use information gained from this study to compare data gathered from another site on this stream closer to the coast or from any stream closer to the coast.

Learning areas

Science: *Living World-Ecology-Evolution, Nature of Science-Living World-Ecology, Participating and contributing*
Mathematics and Statistics: *Number strategies and number knowledge*
Social Sciences: *Place and Environment*

Students will learn:

- how the presence or absence of certain macroinvertebrates can tell us a great deal about the health of any waterway.
- that invertebrates are vital components of the freshwater ecosystem.
- that water temperature and water clarity readings also provide valuable information about a stream's health.
- that other data can be used, such as pH readings, conductivity readings, stream bed assessments and bank vegetation assessments to provide more information. These assessments are usually reserved for high school groups.

Points of Interest
Puketewhiti Stream and swing bridge

Key competencies
Thinking
Managing self
Relating to others
Participating and contributing

Essential Skills
Communication
Information gathering
Problem solving
Self-management
Physical
Work and study

Values
Excellence
Innovation
Community and participation
Respect

Activity 15 Animal Pest Management

Duration: 45 minutes
Resource People: TRC Environmental Officer and/or Kevin Archer
This activity is more suited to older primary, intermediate and high school classes.

Keywords:
pest animals, eradication, containment, surveillance, poisons, traps, night shooting, co-operation, control

Lesson description

This lesson reviews the Taranaki Regional Council pest animal management strategy, animal pest categories and methods of control or eradication. Various trapping and poisoning methods are demonstrated.

Learning areas

Social Science: *Place and Environment, Continuity and Change*
Health and Physical Education: *Relationships with Other People, Rights, responsibilities and laws: People and the Environment*
Science: *Living World – Ecology*
Mathematics and Statistics: *Number strategies and number knowledge*
Health and Physical Education: *People and the Environment, Community resources*

Students will learn that:

- the majority of animals classed as 'pests' are mammals that were deliberately brought into New Zealand in earlier times for a variety of reasons.
- pest animals are identified as animals that can and do have a serious, adverse affect on agriculture, animal health, human health, or on native plants and animals.
- the Council works closely with other organisations to achieve the best possible results.
- the Council's self-help possum control programme has been very successful, is on-going and one that requires considerable co-operation from landowners.
- all pest animals are put into three control programmes – eradication, containment or surveillance.
- about different methods of control including those used at Pukeiti.

Resources
A selection of traps, poisons, charts, photographs, display board.

Key competencies (K)
Thinking
Managing self
Participating and contributing

Essential Skills (E)
Communication
Information gathering
Self-management
Work and study

Values (V)
Respect
Community and participation

Photo: Nga Manu images

Pest animals: Possum and rat devouring a chick.

Activity 15 *TRC Pest Management Programme*

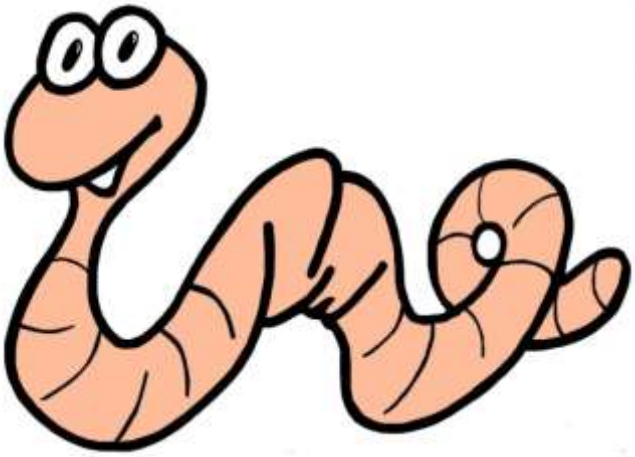
Left: hungry mustelid stoat
Above: common wild rabbit

Below: TRC Environment Officers discuss pest traps with students from Bell Block School

Activity 16 Composting and Worm Farming at Pukeiti

Duration: 30 minutes
Resource People: Pukeiti Gardens Staff and/or Kevin Archer.
This activity would particularly interest classes or teachers looking for ideas to help establish composting and worm farming at their schools or to improve existing systems.

Lesson description



This lesson looks at the composting and worm farms at Pukeiti and how the gardeners use the material produced to enrich the soil.

The children will learn how to establish a new system at your school or how to operate an existing system more efficiently. There will be a chance for questions and more advice.

Learning areas

Social Science: *Place and Environment, Continuity and Change*
Health and Physical Education: *People and the Environment, Community Resources*
Science: *Living World – Ecology, Life Processes*

Above: a thriving colony of 'red tiger' compost worms

Compost can be collected in various ways, such as the three-bay compost bin system (above) or stored simply in a stack of old tyres (right)

Students will learn:

- which materials are suitable or not suitable to be put into the compost bins and worm farms.
- how to set up a compost bin or worm farm.
- how to operate the compost bins and worm farms to get the best results.
- about what type of worms are best suited for use in each process.
- how worms convert organic waste into worm castings and a nutrient-rich liquid, both of which are high quality fertilisers.
- that composting creates humus which provides nutrients for plants and helps retain soil moisture.
- how classroom areas can be good collection points for organic material suitable for use in these processes.

Resources

Compost bins and worm farms, potting building, plant nurseries

Key competencies

Thinking
Participating and contributing

Essential Skills

Communication
Information gathering
Problem solving

Values

Innovation
Community and participation
Respect