

EXPLORING YOUR LOCAL ENVIRONMENT

Education resource



Department of
Conservation
Te Papa Atawhai

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Appendix

Inquiry plan for your green space

Integrated inquiry cycle for working through the IN resources

Connections in an ecosystem

Symbols used in this resource

- This symbol represents a hands-on, outdoor learning experience. These experiences encourage student connection to the natural world
- This symbol represents student activities to learn about their local environment and reflect on their hands-on, outdoor learning experience
- This symbol represents New Zealand Curriculum links included in the resource.
- This symbol represents inquiry-based learning experiences.
- This symbol represents learning experiences around Mātauranga Māori (Māori knowledge and perspectives).

A Introduction



People are part of the natural world

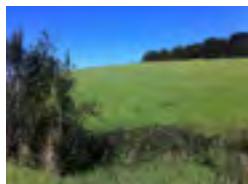
He nohonga ngātahitanga ahau me te taiāo | We live as one with our natural world

Students connecting to and understanding their place in the world

Getting to know your green spaces

ABOUT, IN and **FOR** the environment

A green space is a natural open space (usually green), containing grass, plants, animals, trees and/or forest. Green spaces are great potential habitats for endemic and native animals. Examples of green spaces:



A variety of birds, invertebrates and plants (lots of biodiversity) and natural resources in your green space make up a healthy ecosystem.

Key concepts

Using the **IN the environment** resources students can:

- Connect with their local environment
- Explore green spaces in their school and local environment
- Experience native birds, plants and invertebrates in their green space
- Investigate animal and plant pests and learn about how they affect native species
- Understand how plants, birds, invertebrates and other native and endemic animals are connected and make up a healthy ecosystem
- Contribute to enhancing biodiversity in a green space

Key vocabulary

- **biodiversity** • **ecosystem** • **native** • **endemic** • **species** • **experience**
- **connection** • **conservation**

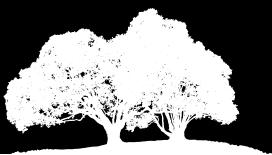
Biodiversity is the variety of living things in a place

Conservation is the protection of animals, plants and natural resources

NO ONE WILL PROTECT WHAT
THEY DON'T CARE ABOUT,
AND NO ONE WILL CARE
ABOUT WHAT THEY HAVE
NEVER EXPERIENCED

- SIR DAVID ATTENBOROUGH

B DOC's Conservation Education resources



What is conservation education?

Learning IN the local environment

DOC are working towards a target of **one million conservation kids**

A conservation kid is a young person who:

- is part of and connected to the natural world
- appreciates that Aotearoa is a special place with unique ecosystems
- understands that caring for our resources of the land and sea is important to our wellbeing and survival

Conservation education is a component of the larger umbrella that is environmental education for sustainability (EEfS).

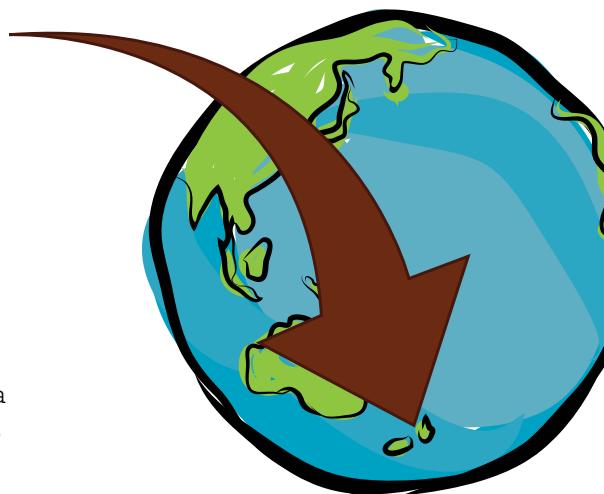
Integrated into EEfS are three dimensions shown in the diagram below. Best practice conservation education (i.e., education about, in and for) results in a range of outcomes. Through students applying acquired knowledge, skills and values, they can actively take a leadership role for a range of real-life local conservation issues. These educational outcomes lead to tangible, on the ground conservation outcomes such as increased biodiversity, predator-free environments and the accumulation of data for citizen science initiatives.

The Big Picture

There are between 30 and 50 trillion stars out there in somewhere between 80 and 140 billion galaxies, but Earth is the only place we call home. It's all we have (that is, until we catch up with Star Trek). For life to survive and thrive here we need to understand that we are all part of one natural world.

Without fresh air, water, seas, fertile soils, forests, mountains, animals and plants, we humans couldn't survive. Everything, even the tiniest of bugs, has a role to play, and that includes us. You are part of your local environment. You, your school and your neighbourhood are all part of a bigger ecosystem. Everything is connected – from the deepest ocean to outer space – and what we do, does make a difference.

For more information about the 'big picture' values and concepts, see www.doc.govt.nz.



Overview of the 'in the environment' resources

Using a local green space (e.g. school grounds, local park, etc.) as a context, the 'In the environment' resource series encourages primary and intermediate students throughout NZ to go outdoors, explore and connect to a local environment. The resources include a range of teaching and learning ideas from stand-alone authentic learning experiences to a comprehensive integrated inquiry unit. We've designed the series so that each resource can be used by itself, or joined together to create a unit of work.

Resources 1-6 are focussed on curriculum-based learning and inquiry as well as EOTC and participating in citizen science projects (e.g. the Garden Bird Survey). Resource 7 supports understanding connections within your green space and developing a restoration plan. This leads onto taking action for the environment (Resource 8).

1. Exploring your local environment

Choosing a green space to work in

Learn about and develop connections to a local green space

Forming an inquiry plan and planning an investigation into biodiversity in your green space



2. Experiencing birds in your green space

Learning about common NZ birds

Gathering data about birds in your green space

Using evidence and reflecting on data

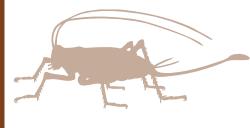


3. Experiencing invertebrates in your green space

Learning about common NZ invertebrates

Gathering data about invertebrates

Using evidence and reflecting on data



4. Experiencing native trees in your green space

Learning about common NZ plants and trees

Gathering data about NZ plants

Using evidence and reflecting on data



5. Investigating animal pests in your green space

Learning about common animal pests in NZ

Gathering data about animal pests

Using evidence and reflecting on data

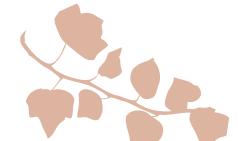


6. Investigating plant pests in your green space

Learning about common plant pests in NZ

Gathering data about plant pests

Using evidence and reflecting on data



7. Enhancing biodiversity in your local environment

Reflecting on species, food sources and habitats found in your green space

Coming to conclusions about the area and sharing your knowledge

Planning how to enhance biodiversity in your green space

Our restoration plan



8. Tools FOR environmental action

Forming an action plan to target a local conservation issue

Creating a brief to inform the action – (technological practice)

Collaborating with your local community

Funding your action – list of national and regional ongoing funds

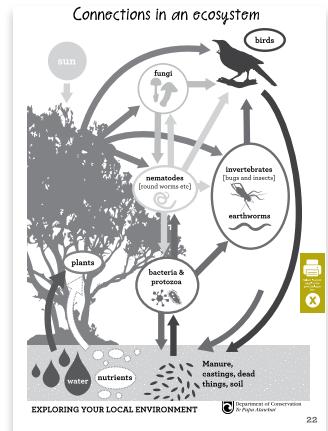
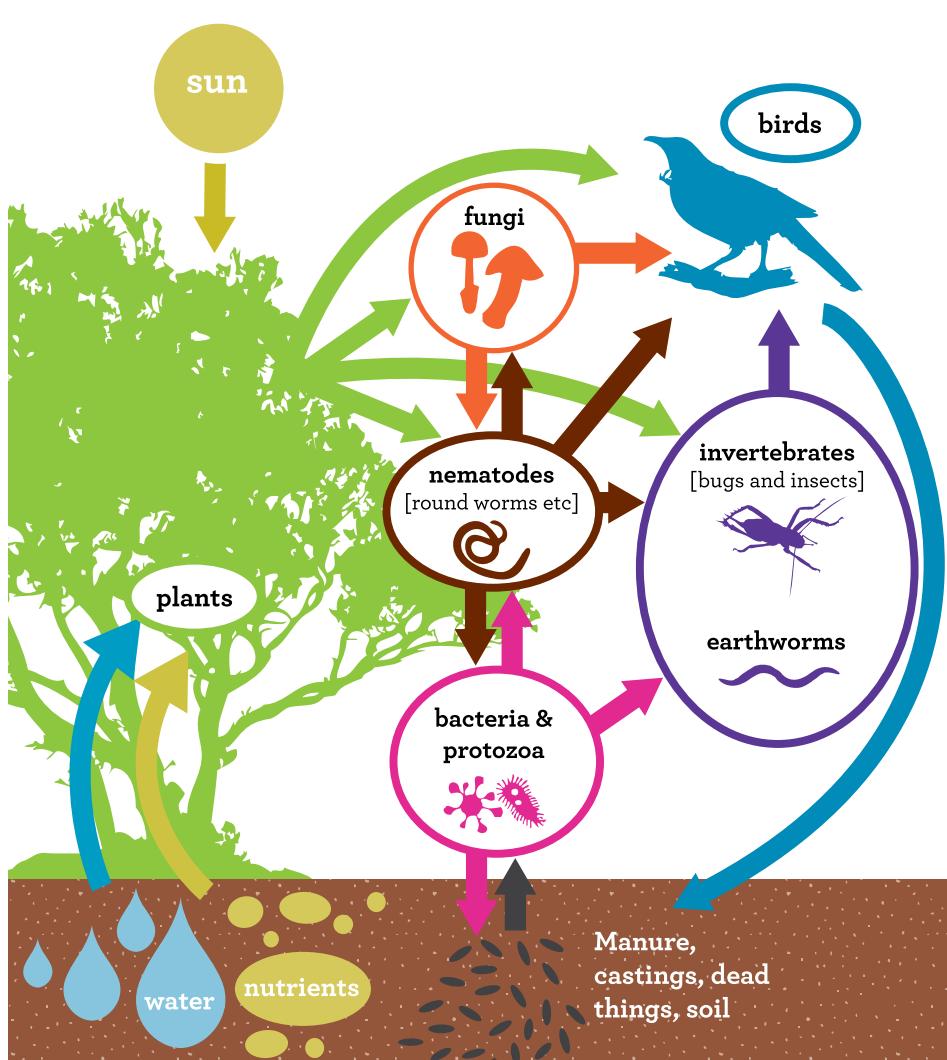
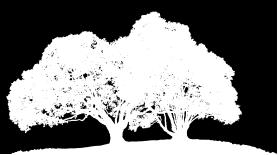
Measuring success and environmental outcomes

Monitoring action and creating a sustainable project





Connections in an ecosystem



Connections in an ecosystem

The diagram above illustrates some of the connections in a typical New Zealand native community or ecosystem. These connections can be between the environment and living things, and also between different living things; e.g. plants and animals. Energy (represented by the arrows in the diagram) passes from the sun to plants to animals and other organisms. Soil, water and nutrients make up an important part of the ecosystem and provide a rich environment where living things can thrive. A healthy ecosystem is where the connections are intact and no part of the ecosystem is disrupted. A healthy environment is also dependent on clean air and water and available nutrients.

Through investigating and monitoring their local green space students can begin to understand these connections and relationships and identify what aspects of the ecosystem could be enhanced in future.

Vocabulary

Ecosystem	A natural system of complex relationships, including the physical environment, plants, animals and other living things
Invertebrates	Animals without a spine or back bone
Nematodes	A thin worm that is not divided into sections, e.g. eelworms (free-living and plant parasites); threadworms, hookworms, roundworms (animal parasites); these feed on mostly fungi and bacteria
Nutrients	Substances that animals and plants need to live and grow
Manure/ castings	Animal poo
Fungi	Living thing which gets its food from decaying material or other living things e.g. mushroom
Protozoa	Extremely small living things that are not plants or animals e.g. amoeba

D Health and safety considerations in the outdoors



Learning in the outdoors requires different planning and teaching methods than in classroom settings. Take time to think through your visit before taking students to a location outside your school. Certain locations within school grounds may also require minor health and safety planning.

Take into account the risks and the nature of the place you are visiting.

NB: Time spent on planning, risk management and paperwork should reflect the relative risk of your activities.

Before your visit consider the following general aspects of health and safety planning:

- How can you minimise any risks to participants at the location you are visiting? (e.g. identify possible risks present in the location you are visiting and have procedures and equipment in place to manage these)
- What are the learning needs of your students?
- Are there any special needs requirements? (medical/ behavioural or learning needs). How will these be catered for during the visit?
- Sufficient staffing and supervision (staff competence, levels of supervision needed for particular students and group of students)
- What equipment will be needed? (teaching and safety equipment)
- Emergency preparedness
- Legal responsibilities, specific responsibilities and codes of practice



Activity: Student safety planning

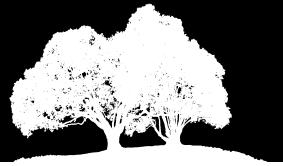
Involve students in health and safety planning. They can help to contribute to organisation and planning for your visit, including identifying risks and emergency preparedness. Students input into safety planning will be more likely to result in the adoption of safety practices and more safety conscious behaviour during the visit.

Students could consider:

- How can they keep each other safe? What can be done if something goes wrong?
- What are their responsibilities? What is their role in safety?
- Students can create a safety action plan (SAP) for the visit using tools on the EOTC website:
www.eotc.tki.org.nz
- Decide on a code of behaviour for the day

For further guidance on health & safety planning and developing safety management plans - see
EOTC Guidelines: Bringing the curriculum alive (updated 2016)

E Getting started: Teaching in nature



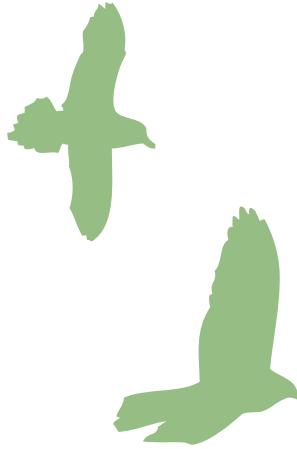
These teaching and learning experiences in the outdoors are designed to:

- Develop connections between students and their green space
- Promote learning **IN** the local environment
- Establishing prior knowledge and experiences

Setting the scene: Thinking about green spaces

What local green spaces are in and around your school?

- Introduce the vocabulary: green spaces, environment, ecosystem and biodiversity. As a class, form definitions of these words
- Share prior experiences of being in the local environment/ green spaces
- Why are these green spaces important? Highlight these on a map of your area
- What are your favourite green spaces? Why?
- Choose a focus green space to do the following activities in



Near, there and far

How do we use our senses to experience our environment?



- Sit quietly individually or with a buddy and concentrate on your surroundings
- First focus on what is NEAR: what can you touch and see close to you? What is within reach?
- Then use your other senses (e.g. hearing and smell) to take in what is THERE (e.g. within smelling distance)
- Lastly concentrate on what is FAR away. Which senses can you use to detect what is far away?
- Talk about and record your findings
- After the experience talk with your buddy about what you noticed with different senses.
- Which senses give us information about things at a distance? (sight, hearing)



Museum of nature

What natural treasures are in our green space?

- Give students a defined green space to work in
- Ask students to collect a few natural objects each within the area. The natural objects could relate to a key word e.g. biodiversity or they could just be interesting objects or things that 'speak' to a student
- Emphasise care of plants, animals and the environment during collection. Provide a rubbish bag for litter found during the collection
- After collecting objects students can choose the most interesting one and create a description of their object. This may also include describing its possible purpose in the green space. Display objects and their descriptions in a room set up like a 'museum'. After examining each other's treasures, talk about what you could assume about the green space from the collection of natural treasures of your group.

Nature hunt for living things

What signs of life are in your green space?

Some objects may suggest that living things are around, even if you can't see them!

- Look carefully at your surroundings in pairs, moving stones, logs and leaves gently to see what is around you. Explore the green space to look for living things (without equipment).
- You may find live animals or things they have left behind, e.g. spider webs, holes in the ground, cicada shells clinging to tree trunks, bird's eggs, snail shells or leaves with holes in them!
- Take photos and record experiences and findings (these may come in handy later on!)

Photo story of your green space

Tell a visual story about your green space

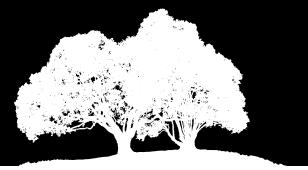
Materials needed: digital cameras/ phones or iPads (make sure you give instructions about caring for devices outdoors)

Photos should tell a story of the local environment e.g. the living things in the area, the history, Māori perspectives or other points of interest

- Head outside and take photos of green spaces in your local environment and school
- Encourage individual interpretations and creative representations
- When students are back in the classroom they can view and choose images to include in their photo story. They can then narrate or write a story to accompany the images. The photo stories could be made into digital, oral, artistic or written presentations depending on student's interests and needs.



F Starting a learning inquiry



Before you start

- Identify a specific area/ green space in your school or community.
- Try some activities from **1. Getting started: teaching in nature** in your green space. For younger students, choose a small area to focus on. There should be potential to enhance the biodiversity in the green space that students choose.
- Use your green space as a starting point for a learning inquiry. Spend time in the green space and ask the community about its history and cultural significance.

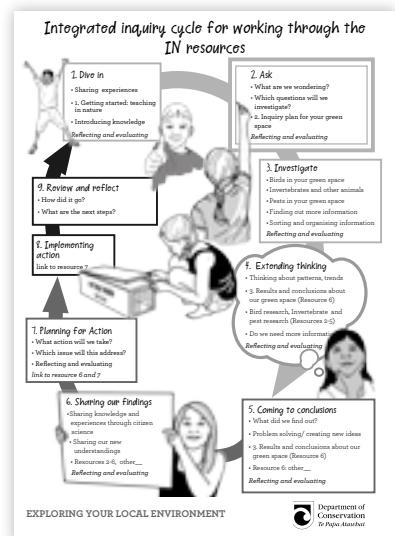
NB: Ensure you have support from the landowners of the area for any educational use and potential enhancement of the green space.

Inquiry plan for your green space

A. Describe your green space What have you noticed and observed in this green space?	B. Ask - What are your questions/ wonders about this green space? These could be about birds, insects, pests, other animals or another aspect of the green space.
C. Investigate – Planning investigations How can you answer your questions? Where can you find information?	
D. People: Which people are involved in your green space? Who owns this green space?	
E. Predictions: Make a prediction about your green space based on your observations, questions and experiences:	

EXPLORING YOUR LOCAL ENVIRONMENT

Department of Conservation
Te Mana Rauhī Taiao 21



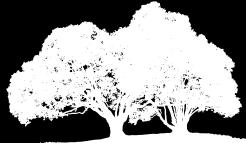
Working through the *Inquiry plan for your green space*.

- After completing several learning experiences in the green space, record findings and questions on **Inquiry plan for your green space**. Students can draw or write about what they found in the green space in A) Describe your green space.
- Record questions that have come to mind during the previous activities in B) Ask- What are your questions about this green space?
- Examine the students' questions from the inquiry plan. These can be a starting point for a learning inquiry. Resources 1-8 can support student inquiry. Decide on some individual and collective inquiry questions as a class. Ensure these questions are open, and require thought and research to answer. Groups of students/ individuals could investigate a question or the whole class could work towards answering a question, depending on the age and ability of students.
- Discuss and record how it might be possible to find answers to their inquiry questions.
- Look into which groups of people might use or have a say in the green space you have identified. Ensure you have support of everyone involved.

6. Explain what a prediction is (A prediction is like a ‘guess’ of what will happen but is usually based on knowledge and experience). Ask students to predict what they think they will find in relation to the question they have asked. You could also use the information you have gathered and your experiences in the green space to make predictions about what might be living here and how healthy the ecosystem could be in E) Prediction.
7. When the inquiry plan is complete students can start to use it to investigate other aspects of the green space and develop a learning inquiry.

Use any of the IN the environment resources to encourage further investigation of the green space and support your inquiry. Teachers can adapt and use ideas from the IN the environment resources to suit students' needs, inquiries and interests.

G Place-based learning in the outdoors



Develop student connections to local environments

Place-based learning allows students to connect directly to their local environment and the life within it. This connection can be on many levels, from physical to emotional. The outdoors provides real-life, engaging learning contexts which provide powerful foundations for teaching and learning across multiple curriculum areas.

Learning outdoors enhances students' sense of self and their perception of place. Interconnectedness and the relationships between people and their physical environment are obvious in the environment. Students are encouraged to explore ideas, apply their experience, gather data and information, use thinking skills, problem solve, and take action in a meaningful way when learning outside.

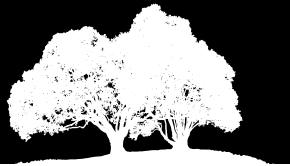
For more information see: www.health.tki.org.nz

The screenshot shows a web page from the tki.org.nz website. The top navigation bar includes links for 'Health', 'Education', 'Culture', and 'Wellbeing'. A search bar is present. The main content area features a large image of a person in a green environment, followed by text and a sidebar with various links and sections.

tki.org.nz - outdoor education



H Māori perspectives and values



 In Te Ao Māori/ a Māori world view the Earth Mother (Papatūānuku) and the Sky Father (Ranginui) are the parents of all living things on Earth. The children of Papatūānuku and Ranginui are the atua (Māori gods/ supreme beings) who are each responsible for a domain of nature. Tāne Mahuta is the atua of the forests, land, land-based biodiversity and green spaces. Māori see particular species as taonga and have developed systems to support these species and their connections.

For more information about Te Ao Māori and how to incorporate these important concepts into your teaching, see: www.maorihistory.tki.org.

The following Māori values will be explored during these learning experiences:

Aroha means love, compassion and understanding. We can show aroha for everything within our ngahere (forest). If we have love, compassion and understanding for ngahere and green spaces, we will protect and grow them for the future.

Mauri All things are united through mauri, the life force or life essence. People are part of the natural world and connected through mauri. The mauri of the natural world has been weakened by pests and habitat destruction but we can restore mauri by looking after our green spaces.

Mana means respect, power and authority. Everything in the natural world has mana.

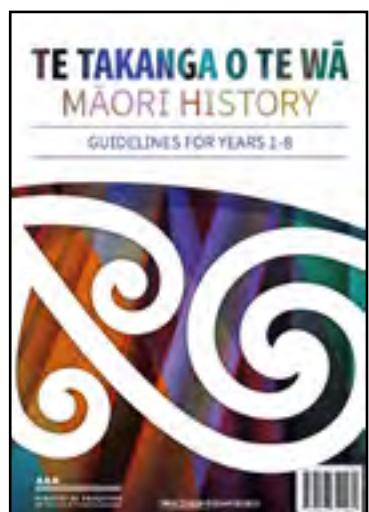
Tapu means sacred. Every part of the natural world, including ourselves has tapu. Some places have a tapu placed on them if they are sacred or for spiritual reasons.

Wairua means spirit. Wairua is about feeling and hearing the spirit or essence of everything around us.

Manaaki means to look after and take care of. It is our responsibility to manaaki (care for) our natural resources.

For more information see www.doc.govt.nz.

These resources also align with Te Marautanga o Aotearoa and support its vision.



Activity - Exploring Māori perspectives

- Contact local iwi through your local council, local marae or through school family connections.
- Use expert advice from tangata whenua to consider Māori perspectives, such as: history and heritage sites, taonga species, cultural uses (e.g. cultural harvesting of harakeke or plants), kaitiakitanga and mauri in the area
- Ask iwi to be involved in your investigations and actions or contribute to what they are already doing in the green space.

Vocabulary

Iwi Tribal group

Tangata whenua The tangata whenua of Aotearoa are Māori people Tangata whenua can be translated as ‘people of the land’. Tangata whenua have special rights and responsibilities for their land.

Kaitiaki People who are recognised by tangata whenua to protect and look after an area’s resources. They act to restore ecosystems through a holistic approach, recognising that all things are interconnected.

I Science capabilities



Education in nature is a natural fit with developing the science capabilities. There are numerous opportunities for developing the science capabilities throughout resources 1-8. The experiences in these resources incorporate and encourage students to develop skills in these science capabilities.

Gather and interpret data

Learners make careful observations in the environment and gather data about birds, invertebrates, pests and other animals in their green space.

The screenshot shows a web page from the Ministry of Education's website. The top navigation bar includes links for 'TKI', 'About TKI', 'Contact us', 'Log in', and 'Science online'. The main content area features a green header with the text 'Science online' and an image of two children looking at a book. Below this, there are several sections: 'What is science?', 'Introducing five science capabilities', 'How can I support my learners to develop their science capabilities?', 'Science online resources', and 'How can I support my learners to develop their science capabilities?'. The page uses a light green and white color scheme with some dark green accents.

tki.org.nz - science capabilities

Use evidence

Learners support/ challenge their ideas about their green space and the life within it with evidence they have gathered. They develop explanations about their evidence.

Critique evidence

Students will think critically about data collection methods and find other information which supports or challenges their ideas.

Interpret representations

Students can represent their ideas in a variety of ways, including models, graphs, charts, diagrams and written texts.

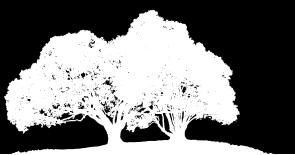
Engage with science

This capability requires learners to use the other capabilities to engage with science in “real life” contexts- e.g. citizen science.

Students can also act to enhance biodiversity in their green space.

Information above is adapted from: www.scienceonline.tki.org.nz.

J Citizen science



Citizen science is a branch of science that involves data being collected by many different citizens from the community (including students) in their own communities. It is used to gather extensive data, enhance public understanding of science, and strengthen links between professional scientists and citizens. Citizen science enables students to participate in the scientific community and contribute to increasing our knowledge about New Zealand biodiversity.

For a list of citizen science projects suitable for NZ primary students see:

www.pond.co.nz

Examples of specific citizen science projects students can get involved in are provided in resources 2-6.

Sharing your knowledge and data using iNaturalistNZ

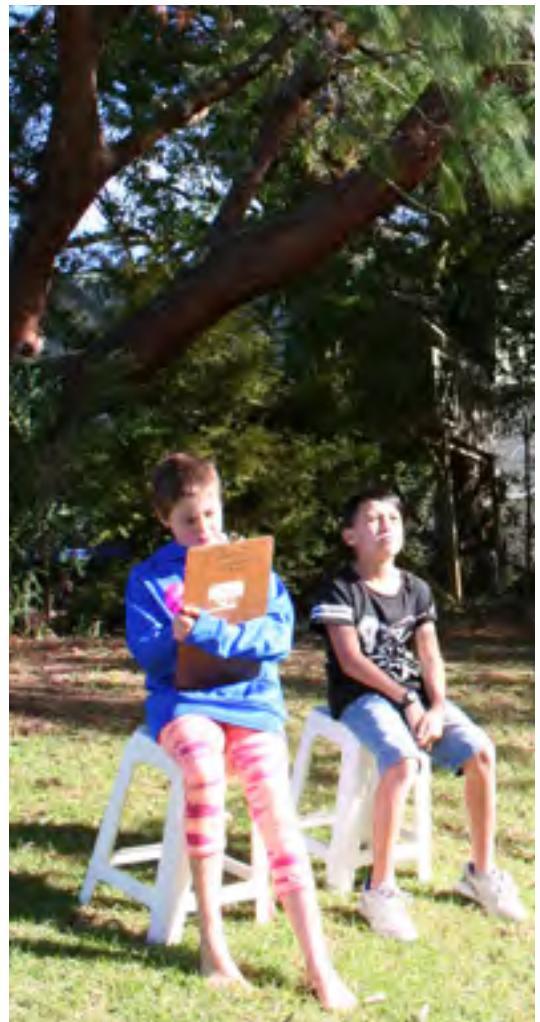
inaturalist.nz

iNaturalistNZ is a well known citizen science hub where you can record what you see in nature, get help from the scientific community to identify your observations and learn about the natural world. Or, if you have a smartphone, tablet or iPad, you can download the iNaturalist app.

While learning outdoors, students can take photos of plants and animals and upload their observations onto the website or app. Teachers will need to register at inaturalist.nz before you can enter observations.

[youtube.com](https://www.youtube.com) – instructional video on how to use the iNaturalistNZ account to make observations.

prezi.com - instructions on how to make your school a place on iNaturalistNZ.



Verran School students conducting a garden bird survey

K Example unit plan for the IN the environment resources (1-8)



MAIN IDEAS	CURRICULUM AREAS	LEVELS/YEARS
Connecting with and experiencing your local environment. Investigating biodiversity in a green space. Enhancing biodiversity.	Science, Social Science, Health, English, Mathematics, Technology	LEVELS: 1-4 YEARS: 1-8
OVERARCHING LEARNING OUTCOMES		
Appreciate that people are part of the natural world Build knowledge and understanding of ecosystems Investigate what is living in a green space Understand how birds, invertebrates and other native and endemic animals and plants are part of a healthy ecosystem Contribute to increasing biodiversity in a green space		
VALUES	Ecological sustainability, respect, innovation, inquiry and curiosity, diversity, community and participation, aroha, tapu, manaaki, wairua, mauri, mana	
KEY COMPETENCIES	Ecological sustainability, respect, innovation, inquiry and curiosity, diversity, community and participation, aroha, tapu, manaaki, wairua, mauri, mana	
PRINCIPLES	Learning to learn Cultural diversity Community engagement Coherence Future focus	

PART 1	Connecting to nature				Experiential teaching and learning in the outdoors. Resource 1: Exploring the local environment	
Learning sequence	Inquiry stage/s	Curriculum links	Key concepts	Description		Suggested timing
1. Exploring your local environment 	1. Dive in 2. Ask	Science: Nature of Science Health: Healthy communities and environments	Students connect to their local environment Experience green spaces in their school and local environment	An overview- introducing key concepts. Students start to form an inquiry plan and ask questions. Identifying a green space and beginning to explore it.		1 week
PART 2	A learning inquiry in your green space Additional key concepts will depend on inquiry questions				Students can start and work through their own learning inquiries using these resources and other relevant additional resources. Schools can use their own inquiry model and resources or use the ones provided.	
PART 3	Investigating birds, invertebrates, other animals, plants and pests in your green space				Resources 2-6. Gathering data about what is living in the green space	
2. Experiencing birds in your green space 	3. Investigate: 4. Extending thinking	Science: Living World, NoS English: Listening, reading and viewing Mathematics: Statistics	Biodiversity Common NZ birds Gathering data and information about what is living in the local environment	Collecting data about birds in the green space. Reflecting on and critiquing data. Continuing their inquiry. Finding out more information.		2-3 weeks
3. Experiencing invertebrates in your green space 	3. Investigate: 4. Extending thinking	Science: Living World, Nature of Science:	Biodiversity Common NZ invertebrates and classification. Gathering information about what is living in the local environment	Collecting data about NZ invertebrates in the green space. Reflecting on and critiquing data. Continuing their inquiry. Finding out more information about invertebrates.		2-3 weeks

4. Experiencing native trees in your green space 	3. Investigate 4. Extending thinking		Common NZ plants and foods for birds and invertebrates	Collecting information about native and endemic plants in the green space.	2-3 weeks
5. Investigating animal pests in your green space 	3. Investigate 4. Extending thinking	Living World, Plant Earth and Beyond Social Sciences	Common NZ animal pests and their effects on native plants, birds and invertebrates	Collecting data and information about animal pests in the green space. Reflecting on and critiquing data. Continuing their inquiry.	2-3 weeks
6. Investigating plant pests in your green space 	3. Investigate 4. Extending thinking	Science: Nature of science, Living world Planet Earth and Beyond	Common NZ plant pests and their effects on native plants, birds and invertebrates	Collecting data and information about plant pests in the green space. Reflecting on and critiquing data. Continuing their inquiry.	2-3 weeks
PART 4	PLANNING TO ENHANCE BIODIVERSITY IN A GREEN SPACE				Using tools in resource 7 students plan how they will enhance biodiversity in their local environment
7. Enhancing biodiversity in your local environment 	5. Coming to conclusions 6. Sharing our findings, 7. Planning for action	Science: Living world, Nature of Science. Health, English	Planning to enhance endemic and native biodiversity in their local green space	Coming to conclusions about life in the green space. Establishing whether it is a healthy ecosystem. Choosing a focus issue and identifying possible actions to tackle the issue and enhance biodiversity	2-3 weeks
PART 5	ACTION TO ENHANCE BIODIVERSITY				Using tools in resource 6 students plan to enhance biodiversity in their green space
8. Tools for action 	8. Implementing action 9. Review and reflect	Technology: Technological practice Science: Nature of science Health	Forming an action plan to target a local conservation issue	Collaborating with your local community to target an environmental issue. Measuring success and environmental outcomes. Effective planning for environmental action. Monitoring, reflecting on action and creating a sustainable project.	3-8 weeks, depending on your action

Inquiry plan for your green space

A. Describe your green space

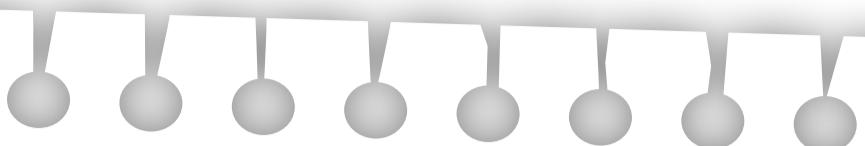
What have you noticed and observed in this green space?

Handwriting practice lines for describing the green space.



C. Investigate—Planning investigations

How can you answer your questions? Where can you find information?



B. Ask – What are your questions/wonderings about this green space?

These could be about birds, insects, pests, other animals or another aspect of the green space.

D. People: Which people are involved in your green space? Who owns this green space?

E. Prediction:

Make a prediction about your green space based on your observations, questions and experiences:

Select 'current page' in the print dialogue box

Integrated inquiry cycle for working through the IN resources



Select 'current page' in the print dialogue box

Connections in an ecosystem

