Maui’s Dolphin –
An inquiry to action

TEACHER’S RESOURCE
Acknowledgements

WWF are keen to acknowledge schools that are active in action for the environment and to support them in their endeavours. If your students are actively involved in protecting the Maui’s dolphin, please let us know so that we can celebrate your achievements with you.

Some of the material in this resource has been drawn from WWF’s Hector’s Dolphin resource. We wish to acknowledge and thank the contributors and developers of this resource.

You can contact us either via our website www.wwf.org.nz or by emailing info@wwf.org.nz
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Background

Welcome to Maui’s dolphin – An inquiry to action

*Maui’s dolphin – An inquiry to action* is a cross-curricular inquiry-learning resource for schools. It is designed to support teachers and students to undertake their own inquiries into the protection of the world’s most endangered marine mammal – Maui’s dolphin.

This resource is designed for levels 2–4 of the New Zealand Curriculum; however, it can be modified by teachers or facilitators and used at all levels. While the curriculum links focus on science and social studies, teaching about this critically endangered dolphin can be integrated into any learning area because it fits within the key competencies outlined by the curriculum.

The teacher’s notes include curriculum links, inquiry learning support, student activities and an extensive list of resources.

When using this resource, you may choose to undertake a short inquiry with your class over a few weeks, or you may prefer to undertake an extended, rich inquiry over a longer period. Whatever you decide, this resource aims to support students and teachers as they come to value the existence of this very special dolphin and start taking action to protect it from extinction.

Why undertake an inquiry to action using Maui’s as a context for learning?

For teachers new to inquiry learning, or those who may be familiar with inquiry and want to base an inquiry on an endemic animal, WWF has produced this resource to help you. We believe that inquiry learning is a great way to learn because it encourages action competence, which is a key goal of education for sustainability. To learn more about inquiry learning (examples of models, theories about it as an approach, and more) we urge you to go to the experts, for example, see TKI’s Social Studies Online http://ssol.tki.org.nz/

At WWF we believe Maui’s dolphin is an excellent context to use for inquiry learning because it:

- engages children, is relevant and urgent, and enables teachers to deliver integrated programmes closely aligned with the curriculum
- provides opportunities for new understandings and insights about how we live in relationship to each other and all living things on this planet
- provides an opportunity for schools to connect with their local communities
- provides an authentic context for implementing an inquiry, with the aim of empowering students to take action.
Meet Maui’s dolphin

The west coast of the North Island is home to one of our rarest endemic animals, Maui’s dolphin. This tiny marine mammal, a subspecies of Hector’s dolphin, is the smallest in the world—adults are the length of an average-sized 10-year-old child and babies are the size of a large cat. They are distinguishable by their small size, rounded dorsal fin (like Mickey Mouse’s ear) and distinctive black, white and grey markings. They are a coastal dolphin, believed to venture no further than 9 nautical miles offshore along the stretch of coast between Taranaki in the south and Dargaville in the north.

They are such a distinct population that the local Whaingaroa (Raglan) residents have given Maui’s dolphin a special name—Popoto, meaning ‘small’ in Māori.

Why are Maui’s dolphins endangered?

Sadly, Maui’s dolphins are also distinguishable by their small number, qualifying them for the title of the world’s rarest dolphin. Prior to the 1970s, the population was believed to have been a healthy 1,000 or so animals. Over the last 40 years, the population has significantly declined; it was most recently estimated at just over 100 animals. Their coastal nature means that they share the same environment in which humans like to fish, surf, swim and boat. The primary causes of their population decline are human-related threats, in particular those from two of the methods used to catch fish: set netting (which uses monofilament gill nets), and trawling. If urgent action is not taken, this species will become extinct within 20 to 30 years. By communities deciding to take action (such as writing or talking to politicians or declaring themselves set-net free) and not allowing Maui’s dolphin to become extinct, WWF-New Zealand firmly believes this species has a chance for survival. By removing their primary threats, and addressing others, such as the quality of the marine environment, there is no reason why these tiny dolphins can’t thrive and recover to their former population.

The work of WWF

WWF is the world’s largest and most experienced independent conservation organisation, with close to 5 million supporters and a global network active in more than 100 countries. WWF’s mission is to stop the degradation of the planet’s natural environment and build a future in which people live in harmony with nature. WWF encourages all New Zealanders to be environmentally responsible and to be advocates for the protection of our native species.

In New Zealand, WWF is campaigning to secure a future for Maui’s dolphins where they are no longer threatened by extinction, and can return to their pre-1970s population. Saving the species is about tackling the problem from every angle, so WWF works with communities, schools, researchers and the government to take action towards a healthy future for these marine mammals.

For ideas of where to go for more information about Maui’s dolphins, see pages 34–40.
Alignment with the New Zealand Curriculum and guidelines

Developing the aims and competencies identified in The New Zealand Curriculum (2007)¹

This resource is aligned with the New Zealand Curriculum. The curriculum provides the following principles, all of which are evident in this resource:

- Community engagement – connecting students with their communities
- Coherence – making links within and across learning areas
- Future focus – encouraging students to consider the future and explore issues such as sustainability, citizenship, enterprise and globalisation
- The Treaty of Waitangi and the bicultural foundations of Aotearoa New Zealand, acknowledging the principles of Te Tiriti and providing students with a knowledge of te reo Māori me ona tikanga

The values of innovation, community and participation, inquiry and ecological sustainability closely link with the objectives of this resource.

Of the five key competencies people use to live, learn, work and contribute as active members of their communities, Maui’s dolphin – An inquiry to action links most directly to the ‘Participating and contributing’ key competency. Using this key competency, students will understand the importance of balancing rights, roles and responsibilities and will contribute to the quality and sustainability of social, cultural, physical and economic environments. Students will work in their own communities and will be faced with real-life issues that have consequences now and in the future. Through exploring the issues around protecting the critically endangered Maui’s dolphin, students will begin to understand their roles and responsibilities in contributing to positive change.

Possible objectives for this inquiry, derived from The New Zealand Curriculum, may include:

- For our students to:
  - become actively involved contributors to the environmental well-being of New Zealand²
  - value ecological sustainability, including the care of the environment³
  - participate and contribute in their community⁴
  - use their growing science knowledge when considering issues of concern to them (levels 3–4 science learning area)

³ Ibid. p 10.
⁴ Ibid. p 13.
– explore various aspects of an issue and make decisions about possible actions (levels 3–4 science learning area)
– understand how people participate individually and collectively in response to community challenges (level 4 social sciences learning area)
– develop the aims and competencies identified in the guidelines in the Education for Sustainability Senior Subject Guidelines.

Undertaking an inquiry into the protection of Maui’s dolphin would provide a pathway for levels 6–8 to meet sustainability achievement standards in the Education for Sustainability Senior Subject Guidelines. This resource incorporates the following education for sustainability strands:

• Knowledge and understanding – students develop knowledge and understanding of sustainability as it relates to protecting Maui’s dolphin
• Attitudes and values – in the context of sustainability, students explore their own attitudes and values and the attitudes and values of others
• Actions – students participate in individual and co-operative actions to address protecting Maui’s dolphin

Furthermore, this resource can lead to sustainability study in years 11, 12 and 13, notably through NCEA sustainability achievement standards such as:

• 90810 – ‘Plan, implement and evaluate a personal action that will contribute towards a sustainable future’
• 90815 – ‘Work co-operatively to develop and present a strategy or design for sustainability in response to a future scenario’
• 90811 – ‘Describe the consequences of human activity within a biophysical environment in relation to a sustainable future’

Developing literacy and information literacy skills identified in The New Zealand Curriculum and Literacy Learning Progressions

An inquiry such as this is an excellent context for the development of your students’ literacy and information literacy skills. Possible objectives for this inquiry, derived from The New Zealand Curriculum and Literacy Learning Progressions, include:

• For students to:
  − form and express ideas and information with increased clarity, drawing on a range of sources (Level 3 English learning area)
  − show increasing awareness of a range of dimensions or viewpoints (Level 3 English learning area)
  − generate ideas alone and with peers or the teacher by brainstorming (writing progressions in Year 3)

5 Ministry of Education. 2009.
6 http://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability
7 http://www.literacyprogressions.tki.org.nz
Inquiry learning

Possible approaches and inquiry models

Inquiry learning is a practical approach to learning that involves students forming their own questions about a topic and then exploring possible answers. Forming questions is part of the plan; solving problems is part of the outcome. Inquiry learning encourages ownership and responsibility, as students actively search for and construct knowledge and meaning through a variety of research methods and resources. As part of this process, students encounter challenging and conflicting ideas and can begin to transfer what they have learnt to new circumstances. This approach sees the teacher as a facilitator of learning experiences involving students as active participants in their learning. Pedagogical ideas from inquiry learning are seen as relevant for teaching environmental education to enhance development of action competence.

You may have an inquiry-planning model that you use regularly in your school. If not, we suggest you explore a number of alternative approaches, such as those suggested here.

An inquiry-learning (information-literacy) model

There are many examples of this model online, for example:

- [http://ictnz.com/infolitmodels.htm](http://ictnz.com/infolitmodels.htm)

These inquiry models vary in complexity, but all provide a framework for inquiry planning, including the stages of planning, searching for information, choosing information, processing information, coming to conclusions and planning for action.

Inquiry learning or information literacy is the model upon which this resource is based.

Action-competence approach

An action-competence approach is an integral feature of education for sustainability. It includes the ability to identify problems, make decisions about solutions and take action that develops the students’ ability to participate in future action on environmental issues. This approach allows students to be hands on, participate in decision making and consequently have more ownership of their learning, while also enabling them to make a significant difference in the community.

Social-inquiry model
Using a social-inquiry approach, students:

- ask questions, gather information and background ideas and examine relevant current issues
- explore and analyse people’s values and perspectives
- consider the ways in which people make decisions and participate in social action
- reflect on and evaluate the understanding they have developed and the responses that may be required.

See the interactive Social Inquiry Planning Tool, which can be found on the Social Sciences Online website (http://socialinquiry.ssol.tki.org.nz).

Maui’s dolphin inquiry learning for action

Planning a teacher-directed inquiry
A teacher-directed inquiry is most suitable for younger students or teachers and students new to this approach. In your classroom, the exploration into the protection of Maui’s dolphin will be ‘OUR’ inquiry. You will direct the students through a number of learning experiences to develop their understanding, which can then be used as a base for taking action to save Maui’s dolphin.

We have provided a blank planning template created by a teacher on pages 40–41. You may find this model useful or you may choose to use another model. The following guidelines may help you to fill out your inquiry template, with examples for levels 3 and 4 of the New Zealand curriculum. The order is not intended to be linear as the process should be flexible and reflect the needs of your students.

Concepts and conceptual understandings
Choose the concepts and conceptual understandings you want to focus on in the inquiry. For example: ‘People's actions can affect the survival of Maui’s dolphins, leading to changes in the ecology of our world.’ Students will need to revisit these conceptual understandings in a variety of contexts.

Key competencies
The key competencies in The New Zealand Curriculum fit perfectly with inquiry-based learning. Choose which key competencies you wish to focus on in your Maui’s inquiry. For example: ecological sustainability.
Learning outcomes

It is important to specify the learning outcomes that you expect from this inquiry. These learning outcomes could be from any of the learning areas.

For example, from the ‘nature of science’ strand in the Science learning area at levels 3 and 4, students will:

- build on prior experiences, working together to share and examine their own and others’ knowledge (investigating in science)
- use their growing knowledge of science to consider issues of concern to them (investigating in science)
- explore various aspects of an issue and make decisions about possible actions (participating and contributing)
- explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human induced (ecology).

Inquiry stage one: Immersion

At this stage, students spend time immersed in information about the topic, becoming enthused, moved and inspired. This is when students begin to gather the knowledge and understanding they will build on and revise throughout the inquiry to action. Activities 1 and 9 on pages 15 and 29 will be ideal for this stage.

A key part of this stage (sometimes considered a separate stage) is choosing a key question to guide the inquiry. This is when students formulate a question or set of questions related to protecting Maui’s dolphins. Helping students to choose rich, deep questions is a skill that takes some developing. It is recommended that, for students and teachers new to inquiry, there be just one class question, perhaps posed by the teacher. If the teacher and students are more experienced, groups or pairs of students might choose their own key questions and undertake independent inquiries.

Students also need to establish subsidiary questions that will help them answer their key question. A good place to start is to teach students to pose questions beginning with who, what, why, where, how, or which. There are many examples online of further ways to develop questioning skills.

Sample key questions:
- Why isn’t more being done to save the endangered Maui’s dolphin from extinction?
- Why is it important to save Maui’s dolphins from extinction?

Sample subsidiary questions:
- What threats to their survival are Maui’s dolphins facing in New Zealand? What is being done to help them face these threats?
- How does the life cycle of Maui’s dolphins affect other species?
- Where in New Zealand are Maui’s dolphins found? Are any of these areas close to your school?
For more help supporting your students to ask rich questions, see http://www.inquiringmind.co.nz/the_task.htm

**Inquiry stage two: Choosing and using information**

Once the question is posed, students are encouraged to investigate the topic by gathering information from sources that have been either provided by the teacher or found in learning resources or tools that are readily available to the students. Many of the learning experiences on pages 15–33 will be ideal for this stage.

When enough information related to the topic of inquiry is gathered, it is either organised into categories or the important information relative to the topic is highlighted. This organisation should be teacher led, but have a high level of student involvement. This helps the student make connections between new and prior knowledge. Note that prior knowledge was established during the immersion stage, but this stage should be revisited once the key question has been decided. This will ensure that specific prior knowledge relating to that question is established.

Here are some ideas you could use:

An excellent tool is a KWHL chart – what I know, what I want to find out, how I will find out, what I learned (see www.graphic.org/kwhl.html for an example). Used as a whole class wall-chart or individually, these are great because they keep track of the whole inquiry to action process, showing a running record of the expansion of student’s knowledge and understanding. Try to take key words and ideas out of the general brainstorm and into some other form of graphic organiser; for example, a chain or persuasion organiser or a T-chart (see www.enchantedlearning.com/graphicorganizers for examples).

Sources for gathering information could be websites, video clips on YouTube, books, pictures, and people in the community. See pages 34–39 for an extensive list of resources. Talk to students about how to ensure sources are reliable and remind them about obtaining information from a variety of sources.

There are many tools and strategies that will help your students to organise the information they gather. Possibilities include PMIs, a decision-making matrix, comparing and contrasting, similarities and differences, and evaluation and generalisation. Models of all of these can be found online (see www.enchantedlearning.com/graphicorganizers for examples).

The information should be discussed and analysed for further understanding. The teacher can direct the discussion, highlighting the issues that are arising from the inquiry and how these, in turn, have an impact on the choice of action to take.

**Inquiry stage three: Coming to our conclusions**

Before conclusions can be drawn, reflection and analysis must take place. This serves to reinforce the inquiry model so that students can repeat the process in any problem-solving situation. Because of the non-linear nature of inquiry learning, reflection and analysis may lead to a return to a previous stage to gather more information.
The questions below will help your students to analyse and reflect on their inquiry.

- What do we know now about Maui’s dolphins and the importance of their survival?
- Is the information I have gathered relevant? Is it reliable?
- Have I answered my key question well?
- Who could I speak to for more information?
- Should humans be playing a role in the survival of Maui’s dolphins?
- Whose viewpoint do I agree with? What other viewpoints are there?
- What are some of the differences between protecting terrestrial animals and marine animals in New Zealand?
- Why has New Zealand restricted rather than banned the use of set-nets as some other countries have done?
- What sort of impacts, positive and negative, could helping Maui’s dolphins have on local communities?
- How have my feelings towards popoto changed since I began this inquiry to action?

There are many excellent tools, such as a consequence wheel (see Education for Sustainability at http://efs.tki.org.nz/curriculum-resources-and-tools/consequence-wheel/) which can assist students to reflect deeply and fully on their learning.

Inquiry stage four: Planning and taking action

This is when we ask, ‘So what?’ and, ‘Now what?’ That is, we answer the key questions, present our findings and take action.

The action arises from all the research students have undertaken and the various discussions students have been having with their teacher and others in the class.

Action Planning should be carried out with a whole class until students become familiar with the process. Once familiar, students can complete Action Planners in small groups or individually.

An Action Planner:

- is a tool to map the process of student action
- encourages students to plan their learning and can be utilized as part of inquiry learning.

**Generic action planning process**

1. **Raise the issue** with the students.
2. **Identify the issue** with students.
3. **Explore possibilities to clarify the vision** with students, i.e. what is it that we want to achieve?
4. **Plan the action**: consider what exactly needs to be done to achieve the vision. This could include several smaller projects within the larger project that either the whole class is involved with over time, or small groups within the class facilitate. Check that the action addresses the issue.
5. Consider the **skills** required to carry out the action and where more **information** can be found.

6. Consider how **people** will think and feel about the planned action and how you will find this out.

7. **Make some decisions**: what could influence the decision on what to do? List the options and criteria in a decision making matrix to choose the action. Criteria should include:
   - ensuring the action addresses the issue
   - resources required
   - time and learning.

   Add your own criteria as required.

8. Carry out the **action**.

9. **Reflect on Change**. Some questions may include:
   - How can we make people more aware of the issue and our action(s)?
   - Did our actions meet our vision?
   - Did our actions impact on the issue we identified?
   - What do we need to do next?


A great example of action planning can be found at [http://www.nrc.govt.nz/For-Schools/Environmental-education-events/Youth-Summit/2010-Student-action-plans/](http://www.nrc.govt.nz/For-Schools/Environmental-education-events/Youth-Summit/2010-Student-action-plans/)

Enviro-schools have developed an Action Learning Cycle they use as their main tool to help plan and carry out student-led projects. The cycle begins by immersing students in the subject and possibilities – this gives a rich background from which they can then make decisions, design, plan and take action. The reflection that follows raises new ideas and consolidates learning:


There are many ways to present findings and communicate the outcome of an action. These include posters, charts, a wiki, a blog or a prezi, or recorded explanations in the form of an interview using Photo Story 3 (PC), iMovie (Mac) or Movie Maker (PC). Further ideas include PowerPoint presentations, mobiles, talks at assembly, photo stories and digital stories. Note that the way a student chooses to present their information might also be their way of taking action – for example, a student might choose to present their findings in a letter, which they then send to their local newspaper and Member of Parliament (MP).

While students may have thought of a way of presenting or displaying their work at an earlier stage, they may need to change or adapt their idea as the inquiry progresses.
Examples of taking action

There are many different ways of taking action. It is important to determine which action project will best fit the brief and criteria. Some possibilities are:

• make a pamphlet that outlines the facts about the declining Maui’s dolphin population and how people can help. This could be dropped into the letter boxes on each student’s street

• write letters to MPs or the editor of the local paper. This is an effective way to let the government know about your views, and does make a difference. You could even invite your local MP to your school to hear your concerns

• use VoiceThread (http://voicethread.com/) to share their understandings about critically endangered Maui’s dolphins and capture feedback from parents, teachers and peers about their video

• create a digital story about the positive action they have taken to protect Maui’s dolphins and share it with the parent community. Use a flow chart, storyboard or Comic Life application (see http://comiclife.com/) with accompanying procedural text to capture ideas and the sequence of key actions. Consider how the nature of the audience might affect the content and duration of the digital story

• invite the community to a debate on an issue surrounding Maui’s dolphins – for example, a topic such as “Set-nets should be banned”. Students might take each side of the argument, or they may call on appropriate community members to participate

• become kaitiaki (guardians) for a local waterway – use the Whitebait Connection Programme website (http://www.whitebaitconnection.co.nz/) to help you get started. Find out if there is a programme running in your area

• canvas views within your community about declaring yourselves a ‘set-net free’ community. Find out which other countries have banned this type of fishing

• hold a concert at your school to raise funds and awareness for Maui’s dolphins

• adopt a Hector’s dolphin from www.wwf.org.nz

It is important for both students and teachers to review how the whole process went. Students should review their work according to the effectiveness and efficiency of the process by asking questions such as:

• Did I achieve my purpose?

• What could I do better next time? Both peer- and self-assessment are helpful strategies at this stage.
Possible learning experiences and resources

Learning experiences

Below are some learning experiences you could use with your class. You might use them during the choosing and using information stage, or early on in the immersion stage to spark the beginning of the inquiry. In addition, some of these learning experiences may be used as a formative pre-assessment for your programme.

Activity 1: Watch It!

This is an ideal introduction to your inquiry. Both these films work well in the immersion stage of your inquiry as they present information about Maui’s dolphins in a child-friendly manner.

Take Action for Mauis - Short film by WWF-New Zealand:

http://www.wwf.org.nz/take_action/hector_s_and_maui_s_campaign/

Explain to your students that the short film they are about to watch is Te Hurihuri School’s way of taking action, in response to their inquiry into Maui’s dolphins. Remind your students that they will also be taking action in some way as part of the inquiry that they are just beginning.

Watch the WWF short film *Take Action for Mauis*. Record any responses the students have – perhaps using the following graphic organiser with sections ‘this is what I already know, this is what I want to find out, this is what I have learnt’. See http://www.tki.org.nz/r/integration/curriculum/resources/inquiry_gos/kwl_e.php

The following graphic organiser can be used by students to record the facts they have gathered about the topic when watching the short film and then to summarise those facts in their own words: http://www.tki.org.nz/r/integration/curriculum/resources/inquiry_gos/facts_e.php

This graphic organiser can be used for students to record all the keywords that they can think of relating to a particular topic while they are watching the short film and throughout the inquiry: http://www.tki.org.nz/r/integration/curriculum/resources/inquiry_gos/keywords_e.php

Maui, New Zealand’s critically endangered dolphin (animation by Julie Holmes)

http://www.wwf.org.nz/take_action/hector_s_and_maui_s_campaign/

Watch the compelling animated short film for children, made by Massey University graduate, Julie Holmes. After watching, add any new information to the graphic organisers used above.
Activity 2: Maui’s dolphin – a critically endangered species

Background

The International Union for the Conservation of Nature (IUCN) assesses the conservation status of species worldwide using the IUCN Red List Categories and Criteria (www.redlist.org) to highlight species threatened with extinction and promote their conservation.

Maui’s dolphin (Cephalorhynchus hectori maui) is categorised as “critically endangered”. This is because the population has declined by more than 90% over the last three generations. In the 1970s Maui’s dolphins numbered around 1,000, but today only 100 or so remain.

The main threat to Maui’s dolphins is accidental death by being caught in fishing nets. Additional threats include pollution, disease, being hit by boats, and changes to their habitat.

If these threats are not reduced, Maui’s dolphins may become extinct. To reduce these threats we need to know about the biology and behaviour of the dolphins and how people interact with them. We need to help people realise the impact of their actions on the dolphins and help them change their attitudes and behaviours so Maui’s dolphins will not end up on the IUCN’s Extinct Red List.

Instructions

1. As a class, brainstorm all the endangered species that students know. You may like to focus just on native animals or think of all plants and animals worldwide.

2. Introduce students to the concept of the IUCN Red List and its categories:
   - Extinct (e.g. moa, huia, short-tailed bat)
   - Extinct in the wild
   - Critically endangered (e.g. kakapo, Archey’s frog, black stilt, Cromwell chafer beetle)
   - Endangered
   - Vulnerable
   - Low risk
   - Data deficient

3. Ask students why it is a good idea to have the same categories worldwide to determine the conservation status of plants and animals. Some ideas are to:
   - provide a system that is consistently used by different people
   - provide people with clear guidance on how to evaluate risks of extinction
   - provide a way to compare different plants and animals
   - give people a better understanding of how individual species are classified.
4. In groups, ask students to come up with an example of one animal to fit each of the categories above. Note, there are no ‘extinct in the wild’ but ‘alive in captivity’ species in New Zealand, so you may like to discount this category. Senior students can visit www.redlist.org to conduct a search by category and country if you prefer.

5. Each student in the group chooses to be one of the brainstormed animals, and must find other animals in the class who are in the same category. Once these groups are formed, each group chooses one of the animals to role-play to the rest of the class. In the role-play, the students work together to create one animal (so they need to cooperate to be the head, feet/tail, wings/flippers etc). Once groups have had time to practise their animal, sit everyone down and ask groups to perform one at a time while the audience guesses which animal they represent.
Activity 3: What a Legend!

He tu te Pahu, He tu te Tai – If the dolphin is well, so too are our coasts (Waitaha proverb).

Background:

Traditionally, Māori have many names for the dolphins of New Zealand. Names vary from place to place, and season to season. The name used for Maui’s dolphins by locals of the Whaingaroa (Raglan) area is popoto (say “paw paw taw”). The most common name for Hector’s dolphins is Pahu. Some other names commonly used for various species of dolphins are Aihe, Tutumairekurai (special ocean dweller), Tāpoupou, Papakanua, Tukuperu, Upokohue and Hopuhopu.

Dolphins are thought of as having a special connection with humans by Māori people. For the Tainui people, the popoto is very special. A legend tells of how their ancestors travelled from Hawaiki to Aotea Harbour on the back of a popoto. This amazing dolphin was called Panereira, and this legend is one reason why the people of Ngati Te Wehi and other descendants of the Tanui waka are working so hard to protect Maui’s dolphins.

Non Māori also have many legends and tales about how dolphins have affected the lives of people. For example, there are stories from Akaroa of Hector’s dolphins saving young children from drowning.

Schools will benefit from developing a relationship with their local iwi or hapu to gain a greater understanding of Māori perspectives about local histories and events.

We encourage your school to make contact with local iwi or hapu and discuss what you and your students are planning to do. Work together to find appropriate ways for Māori to share their knowledge, skills, history, beliefs and practices about your inquiry. You may choose to work in partnership with local iwi or hapu to take action for Maui’s.

Instructions

1. Ask students to think of any legends, stories or myths they know about animals helping people. Write up all ideas on a chart.

2. Share the above background with your class. Then spend some time sharing stories about dolphins: see pp. 34–35 ‘New Zealand Dolphins’, and visit this website to see a film about the relationship between Maui’s dolphins and the people of Aotea and Raglan harbours: http://www.aoteamoana.co.nz/

3. Next, it is time to seek out the legends and stories of the community. You may want to do this as a class, by inviting someone in to share their knowledge, or in groups, with students conducting interviews of individuals from the community:
   - As a class, make a list of all the places students could look to discover the stories. Identify resources that may be helpful. (Friends and family, elders of the community, local museums and the internet – many small organisations have websites sharing their stories and legends. (See ‘Local Communities’, p.39))
4. After deciding where to look, carry out the research – invite in the speaker/ conduct interviews. (If interviewing, make sure students are well prepared with questions, reminders about appropriate manners, and how to keep safe).

5. There may not be any local stories about sea animals like dolphins. Instead, search for legends about other animals that have made a difference in people's lives – perhaps a certain bird with special meaning to your community.

6. Groups decide how to present their findings – possibilities include publishing their findings on the school website or class blog, a local community paper, visual art, or by using technology such as VoiceThread or podcasts.
Activity 4: Drawing Maui

You will need
Maui’s dolphin drawing (see Appendix 2)

Instructions
Follow the instructions to draw a Maui’s dolphin on the board, while discussing distinctive features for survival and identification.

1. Discuss: Imagine you were dropped in the ocean. How well could you survive? What challenges would you face? Talk about the difficulties humans face in the sea – for example, we get cold if we’re in too long, we tire from swimming, it’s hard to stay afloat for very long (without the help of a life jacket), and so on.
   • Introduce the body that is layered in “blubber”. Blubber is a layer of fat that insulates marine mammals and helps them stay warm and buoyant. The blubber is found all over the body.
   • Draw the streamlined shape of a dolphin’s body on the board (leave out the flukes and fins).

2. Discuss: Blubber keeps the dolphin warm and buoyant, but it can’t move very well yet. What can help the dolphin move through the water?
   • Introduce the fluke. The fluke is a tail fin that propels the dolphin through the water. The fluke can pump up and down for a long time without getting tired.
   • Draw a fluke on the dolphin’s body.

3. Discuss: Now the dolphin is warm, buoyant and can move, but it can only move in one direction! It can’t turn. What can help it to steer left or right?
   • Introduce pectoral flippers. Inside the pectoral flippers are bones just like our hands, but the flippers have adapted by becoming flat and wide (webbed). The flippers help the dolphin to swim left, right and stop.
   • Draw pectoral flippers on the dolphin’s body.

4. Discuss: Now the dolphin is warm and buoyant, and can move forward, left, right and stop, but it still has a problem. When it moves forward, it starts to wobble about. It’s finding it hard to stay upright. What could help it stay upright in the water?
   • Introduce the dorsal fin. The dorsal fin acts like a rudder. It helps the dolphin stay upright in the water as it swims along.
   • Draw a rounded dorsal fin on top of the dolphin’s body.
5. Discuss: Take a close look at the dorsal fin. It is different from any other dolphin you'll see around New Zealand. It is short and rounded. Other dolphins have a larger dorsal fin that is either pointy or sickle-shaped. Another thing that’s different about Maui’s dolphins is that they’re a lot smaller than other dolphins. A fully grown adult is only about 1.7 metres long. Other dolphins can be more than twice as big.

6. Draw in the distinctive markings and colouration of Maui’s dolphins and discuss how these differ from other dolphins.
Activity 5: Flippers, fins and flukes

You will need

Juniors
- Pre-cut black construction paper flukes (one for each student)
- Pre-cut black construction paper dorsal fins (one for each student)
- Pre-cut black construction paper pectoral flippers (four per student)
- Large brown paper rubbish bag dolphin body (one for each student)

Seniors
- Plenty of black construction paper for students to make flukes, dorsal fins and flippers
- Large brown paper rubbish bags (one for each student or group)

All
- Maui’s dolphin drawing (see Appendix 2)
- Glue
- Black and white crayons

Instructions

1. Distribute brown paper rubbish bags to students and ask them to cut an opening up the front of the bag, a circle at the top for the head and armholes on each side. The bag is the streamlined body (with blubber) of the Maui’s dolphin.

2. Review the name and function of the body parts, draw them on the board and then pass out to the students (or ask students to cut) flukes, pectoral flippers and dorsal fins.

3. Students glue the fluke to the base (open end) of the bag.

4. Show students how to glue around the outside of the pectoral flippers to make a “glove” they can slip their hand into. Set them aside to dry.

5. Show students how to fold flaps at the bottom of the dorsal fin and glue the bottoms of the flaps to the back (uncut side) of the bag so that the fin stands up. Glue fin about two thirds along the centre of bag. Make sure that the fin curves back towards the flukes.

6. Students colour the fronts and backs of their bags.

7. Students can now put on their suits with the cut side in front. The pectoral flippers slide over the hands. Role-play Maui’s dolphins’ behaviour including swimming (flukes move up and down), jumping, diving, steering and turning with their flippers, and chasing and catching food.
Activity 6: How do you compare to Maui’s?
– Dolphin maths

You will need
- Maui’s dolphin drawing (see Appendix 2)
- Tape measure and ruler per group of three students

Instructions
1. Students first estimate whether or not they think they will be smaller than, the same length as or longer than a Maui’s dolphin. Record a tally of each of these on the board.
2. Students then lie along the length of a life-size Maui’s dolphin drawn in chalk on the ground or a line measuring 1.2–1.7m and arrange themselves into groups, who are smaller, the same length or longer than a Maui’s dolphin.
3. Make a table on the board with two columns. Label the first column, “Height/Length” and the second column “Number of students”. Students work in groups of three to measure each other’s height. One student stands against a wall. The second student marks the height against the wall by placing a ruler on top of the first student’s head. The third student uses the tape measure to measure the height from the ruler to the floor. Alternatively they may prefer to lie along the floor.
4. As each group completes their height/length measurements, their data is recorded on the table by writing in the height/length of each student and making a tally mark in the second column. If their height is already listed, then only a tally mark is needed.
5. After all the data is collected the students display the results as a bar graph.
6. Depending upon the level of students, conclude the analysis by:
   a) Writing the total number of students whose height is:
      • less than the smallest average length of an adult dolphin (1.2m), using the < symbol
      • greater than the largest average length of an adult dolphin (1.7m), using the > symbol
      • the same as the length of the dolphins (1.2–1.7m), using the = symbol
   b) Calculating the fraction or percentage of students that:
      • are shorter than the smallest average length of an adult dolphin (1.2m)
      • are taller than the largest average length of an adult dolphin (1.7m)
      • have the same height as the average length of an adult dolphin (1.2–1.7m)
7. Additional exercises:
   a) Students can make a list of items in the classroom that are the same length as a newborn calf (50–70cm).
b) Students can conduct research to find out the average length and weight of a newborn human baby to discover if they are about the same size or smaller or larger than newborn Maui’s dolphin calves.

c) Students can compare the maximum length of the four most commonly seen dolphins in New Zealand: bottlenose dolphin (4.0m); common dolphin (2.4m); dusky dolphin (2.1m) and Maui’s dolphin (1.7m). On a concrete surface, the students measure and mark out the different lengths of the commonly seen dolphins using different coloured chalk. This offers a simple but vivid visual comparison.
Activity 7: What is endemism?

Background

Maui’s dolphins are endemic to New Zealand. This means they occur nowhere else in the world. Students may be confused over the terms native, endemic and endangered. This activity helps to clarify that species may be: a) native but not endemic, b) both native and endemic or c) neither (that is, introduced or exotic).

You will need

- Different coloured beans, beads, counters or other small coloured objects
- Six different jars labelled with different regions, for example, Africa, Europe, Asia, North America, South America, and Australasia

Instructions

1. Lay out the jars on a display table labelled by region.
2. Explain that each colour of counters represents an animal or plant species.
3. Explain that a ‘global’ species lives in many habitats or places around the world and drop a few or many of your most common coloured counters in most or all of the jars.
4. Explain that an ‘endemic’ species only lives in one specific habitat or place and drop all of a different colour into only one jar. Explain that all the individuals of this species are found only in this one place.
5. Ask students to come up and distribute another ‘global’ species and another ‘endemic’ species to reinforce the concept.
6. Brainstorm New Zealand animals that the students know to be global (e.g. black-backed gull and bottlenose dolphin) and endemic (kiwi and tuatara). Emphasise that Maui’s dolphin is endemic and found nowhere else in the world except around the West Coast of the North Island of New Zealand.
7. If you wish to distinguish between ‘endemic’ and ‘native’, explain that ‘native’ species are those that have always lived in the same place, but they can be native to more than one place. Drop a few tokens of a different colour into two jars. Introduced or exotic species are those that were not originally found here but arrived within human history, either by natural means (e.g. birds being blown over from Australia) or intentionally or accidentally introduced by people. You may like to move some counters of one colour from one jar to another which does not have that colour (be sure to leave some behind, not all individuals of the same species would leave!). A species is ‘extinct’ when all individuals have died out. Remove all of one colour from all the jars. You may use this to illustrate why endemic species are more vulnerable to extinction.
8. As an extension, students can create a marine collage of their local coast. One group can take responsibility for drawing a large base map of their local area showing distinctive landmarks and water depth (if available). Another group can research a species list of plants and animals that live in the local area, while others gather images of these species from magazines, newspapers, photographs and the Internet. These images should be placed in relevant areas of the map depending upon where they live; deep sea, shallow waters, rocky shore, sandy shore, etc. A key can be made to indicate special features of some species, for example, endemic, native or endangered.
Activity 8: Maui’s dolphin life cycle

Background

Maui’s dolphins are thought to live to about 20 years old. Maui’s dolphins are slow breeders compared to other mammals and female Maui’s will only have four to seven calves in their lifetimes. This low rate of population growth is what makes Maui’s dolphins so vulnerable to extinction. Any negative impacts on the population, especially the breeding females, can lower their reproductive rate and may cause the population to decline over time.

You will need

• Maui’s Dolphin Life Cycle drawing (see Appendix 2)

Instructions

1. Hand out copies of the drawing and talk through the different stages of the life cycle, starting with the calf.

2. Introduce each life stage, using the information provided below.

3. After introducing each stage, ask the students to describe the similarities and differences between each stage of a Maui’s dolphin’s life and a human life.

4. Once the life cycle is complete, ask students which life stages they think are most vulnerable to human activities and why.

5. Ask why they think it is important to avoid killing or stressing female adults in particular. Discuss the scenario that would occur if an adult female died; for example, if she was feeding a calf it may not survive and she would be unable to have any more calves. Therefore, although we only knew of one dolphin dying, the population lost the potential to have four or seven more dolphins.

Notes to accompany Maui’s Dolphin Life Cycle drawing:

Calves

Maui’s dolphin calves are born in summer. Newborn calves are less than half the size of adults, darker in colour, and have pale vertical lines (called foetal folds) along their sides, caused by being curled up inside their mother. Initially they are completely dependent on their mother to practice swimming to the surface to catch a breath and to drink milk so they can build up a fat layer of blubber to withstand the cold water temperatures of winter. Mothers with newborn calves are more wary of boats and other things that could harm them. Often nursery groups of mothers and calves will stay together and help each other. This allows a mother to dive deep to the sea floor to get food without worrying about leaving her calf. At around six months, calves begin to feed on small crustaceans (e.g. crabs and shrimps) and small fish near the surface. By the end of their first year, calves will eat the same as adults and will swim off on their own to play with other calves, dolphins and even seagulls. However, they are still noticeably smaller than adults and stay with their mother most of the time. Like other mammals, this time is very important to the survival of
a calf. It is probably when they learn about what to eat (or not eat), to be alert for sharks, orcas, leopard seals and other predators, and how to search for food using their sonar.

Human babies are also completely dependent on adults for protection and most drink their mother's milk as their only source of food for the first few months of their lives before starting to eat other solid foods, about the same time as the calves. Many babies also still have mother's milk for a year or more, just like dolphins. When they are one year old, many human babies are crawling and walking and starting to play with others, but still need an adult nearby just like dolphin calves. Humans with babies often group together to share care and give each other a break from looking after their babies, just like dolphins.

**Juveniles**

After their first year, calves become curious, highly active juveniles and often get in trouble with their mother or other adults (just like human toddlers). This time is probably when they learn how to behave and communicate with other Maui’s dolphins. Juveniles will stay with their mother (sometimes still nursing) until she has another calf, when the juvenile is two or three years old.

**Immature Adults**

Once they leave their mothers, these immature adults are almost fully grown and can take care of themselves, but cannot yet have their own calves. Immature adults spend their time exploring and interacting with other dolphins and other species. This stage only lasts for a few years in dolphins; in humans this stage often lasts a lot longer.

**Mature Adults**

Female dolphins reach maturity between seven and nine years old, while males mature around six to nine years. At this point, they can reproduce and have their own calves and the cycle will start again.
Activity 9: Clever clicks – echolocation

You will need
- 3 blindfolds
- Clever clicks – Echolocation drawing (see Appendix 2)

Instructions

1. Form a circle small enough for students to just touch hands. Choose one student to be the Maui’s dolphin and hand her/him a blindfold to wear. Ask the students why the dolphin is wearing a blindfold (because Maui’s hunt for their prey in murky shallow waters where they cannot rely on their sight).

2. Maui’s dolphins eat mainly arrow squid, Ahuru, red cod, sole, stargazer and sprat. They have also been observed to catch young kahawai and yellow-eyed mullet. Choose two students to be the prey and give them blindfolds, for the same reason as above.

3. The idea of the game is for the Maui’s dolphin to try and catch a fish. But with no sight, the dolphin must use echolocation. Bring the dolphin and fish into the circle (with blindfolds off) and demonstrate how the dolphin will say “click” to represent the sound a Maui’s makes when it is trying to work out what is in its surroundings. The crucial instruction is that every time the dolphin says “click” the fish MUST reply “fish” as quickly as possible. This represents the sonar sound bouncing off the fish and echoing back to the dolphin. In this way, the dolphin can ‘hear’ where the fish are and has to try to catch them! Ensure the students understand their roles – dolphin says “click” and must try to catch the fish; fish must reply “fish” whenever they hear a “click” and have to try to avoid being caught.

4. Ask students to put their blindfolds on and have three other students spin them around to disorient them. The rest of the students should spread their arms to complete the circle and stay quiet. Their job is to gently prevent the fish and dolphin wandering outside the circle.

5. Start the game. Stop when one fish has been caught and give other students a turn. The ‘dolphin’ should quickly discover that by saying “click”, “click”, “click”, “click” in quick succession (but waiting briefly for an answer), they will get the most information possible and can hone in on a fish quicker. You may like to try the game with two dolphins working together to catch one fish. Is it easier or more difficult to interpret the clicks and echoes?

6. Discuss what was easy and what was difficult about the game from the fish and the dolphin’s point of view. What would be similar or different when a real dolphin tries to catch a real fish?

7. You may like to show students the ‘Clever clicks – Echolocation’ drawing (Appendix 2), to reiterate how echolocation works and/or the parts of the dolphin involved in echolocation.

8. Ask the students, what else could Maui’s dolphins use their echolocation or click sounds for? You may like to follow this game immediately with the next activity: Where’s My Baby?
Activity 10: Where’s my baby?

You will need
- Six pairs of sound makers (such as balloons, dried beans in a jar, whistles, clickers, etc)
- 12 blindfolds

Instructions
1. In a clear space, select six students and ask them to choose a partner (others will have a turn soon). Hand out sound makers so both individuals in each pair makes the same sound.
2. Each pair decides which person is the ‘mother’ and which is the ‘calf’.
3. Separate the mothers on one side of the room and the calves on the opposite side of the room. The other students need to blindfold the calves and mothers and mix them up within their groups gently.
4. Have the calves begin ‘calling’ their mothers using their sound makers; the mothers may only respond using their matching sound.
5. The game stops when all of the pairs find each other.
6. Discuss:
   - Why do you think the blindfolds were used? (The blindfolds represent the marine environment, where it is murky and hard to see.)
   - Can you think of other characteristics of the marine environment or the dolphins that would make it hard for mothers and calves to find each other? (For example, Maui’s dolphins all look alike; individuals do not have many distinguishing characteristics, in the marine environment marine animals move forward and backward (as we do) but they also can move up and down through the water.)
   - What sounds were most successful? Were there any similarities and/or differences between the sounds that were successful and those that were not?
   - Was there anything that made finding your calf harder and/or easier?
   - What mother/calf recognition signals, other than sound, may be successful for communication in a marine environment? For example, other marine animals have a heightened sense of smell to identify prey or predators.
   - Did any two pairs have very similar sounds, how did these add to the confusion? Ask the students what else could Maui’s dolphins use their echolocation or click sounds for?
7. If you haven’t played Clever Clicks yet, you may like to immediately after this activity.
Activity 11: Protect Maui’s from pollution

Background
For generations, humans have dumped waste in the ocean because we thought it was large enough to dilute most substances. Shallow, coastal areas often receive the most pollution from sewage outfalls, storm water, and agricultural and industrial run-off. Over time, such pollution has accumulated and it is clear that the pollution doesn't disappear. We need to take responsibility for our waste and not dump it where it will harm other living organisms. Many people consider themselves environmentally friendly and express concern for the future of the planet, but often our actions can be in conflict with these values. The Pollution Quiz will show you we can all easily improve our environmental habits.

You will need
- Pollution Quiz – one per student (see Appendix 2)

Instructions
1. Hand out copies of the Pollution Quiz worksheet to each student to take home and fill in with their family as a homework exercise.
2. The next day, draw a tally table on the board as below and ask students to come and mark off their score. This gives some anonymity to the scores.
3. How did you and your family score?

<table>
<thead>
<tr>
<th>Pollution points</th>
<th>100 points or above: Indeed, you are a friendly family of the planet!</th>
<th>80–99 points: You are a concerned family and doing well.</th>
<th>60–79 points: Your family is making an effort but could make a plan to try and pollute less.</th>
<th>Below 60 points: Your family is at the beginning of your environmental journey. Consider making a plan to try and pollute less.</th>
</tr>
</thead>
</table>

Class Tally

4. Discuss, what were the easiest things to do that gave you positive pollution points? What were the hardest things to do that gave you positive pollution points? What was the most common thing people did that gave them negative pollution points? How could you easily overcome this problem?

5. Students can then identify the things that their family does that gave them negative points and ask them to talk to their family about how they can all help each other change these.
6. Brainstorm other things that people can do to decrease pollution.

7. Brainstorm how the students can make a difference to help protect Maui’s dolphins from pollution.

More ideas for learning experiences

**Social studies**

- Create two pictures of Maui’s dolphins in their habitat – one with humans and one without humans – to show the impact humans can have. This links to English and visual arts.

- Read or use the Internet to find out how people are trying to protect Maui’s dolphins. This links to English, technology and inquiry skills.

- Use graphs, continue a sequence or use number sentences using < and > to provide information about endangered species' populations. This links to mathematics.

- Use drama to develop a community of people who use the sea where Maui’s dolphins live. Use drama to explore the rights and responsibilities of these people. This links to English and drama.

- Make a class poster containing instructions that define the responsibilities of people who use marine areas, or a children’s book about how people can enjoy the sea and also look after Maui’s dolphins. This links to English and visual arts.

- Listen to a range of stories and non-fiction texts about the sea and its use. Think, pair, share to make a star diagram showing people’s uses of the marine environment. This links to English.

- Use a flow chart to show cause and effect of threats to the Maui’s dolphin population.

- Use speech bubbles or ‘hot seating’ to compare and contrast people’s views of the marine environment. This links to English and drama.

- Investigate what the New Zealand government is doing to protect Maui’s dolphin.

**Science**

- Study photos, pictures or diagrams of a Maui’s dolphin to help draw it. Use card and materials such as string or wool to explore how to compose the correct shapes, colours and lines and express the function of various parts of the dolphin (see Activity 5). This links to visual arts and mathematics.

- Use the Internet to determine the definitions of and differences between mammals and fish. Give reasons for classifying Maui’s dolphins as mammals and not fish. This links to technology and science processes.

- Use Internet sites about classification. Group cut-outs of marine organisms (such as marine plants, crustaceans, fish and mammals) according to differences and give reasons for your groupings. This links to technology and mathematics.
• In pairs, use books and the Internet to find out about dolphins’ special physical features and skills. Create labels for a poster or outline of a Maui’s dolphin that describe its special features. Play an echolocation game (See Activity 9). This links to physical education and health.

• Use Maui’s and Hector’s dolphin Internet sites to explain why the population is so small.

• Describe factors that prevent a quick recovery of the populations (such as slow breeding). Make estimates and explore concepts of numerical change relating to the future population of Maui’s dolphin (such as birth and death rates). This links to mathematics.

• Create a food-chain mobile or a group or whole-class mural of a Maui’s dolphin habitat. This links to visual arts, English and science.

• In groups, investigate what is being done to protect Maui’s dolphins. Read about children’s environmental activism in texts or on the Internet. After a class discussion, brainstorm and then mind map solutions, dividing them into things that all people can do together and things that adults and students can do as separate groups. Include a category for what the class could do. This could involve a class survey and measuring qualitative data. Come to an agreement on a class project. This links to mathematics.

• Show, through drama, why the class is involved with protecting Maui’s dolphins. Devise a series of scenes to convey students’ ideas, feelings and attitudes about the critical endangerment of Maui’s dolphin. Present the scenes in the format of a current-events programme that is suitable for young people. This links to drama, technology and English.

• Many coastal communities support businesses with dolphin-watching facilities. If your school is local to one of these businesses, explore the possibility of a field trip to see dolphins in their natural environment.
Resources

Background information for teachers

Learn more about Maui’s dolphin’s ecology, distribution and the threats it faces by visiting the WWF-New Zealand website (www.wwf.org.nz). This website has the following downloads for your inquiry:

- Factsheets:
  - What we know about Hector’s and Maui’s dolphins
  - False claims about dolphins – and the truth
  - International irony
  - Economic benefits of saving dolphins
  - Kiwis want action
- Colmar Brunton Research: New Zealanders’ views on the protection of Hector’s and Maui’s dolphins
- WWF Maui’s dolphins sightings network, where the public report seeing dolphins

Books

<table>
<thead>
<tr>
<th>New Zealand dolphins</th>
<th>Author: Todd, Barbara</th>
<th>Author: Jones, Jenny</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title:</strong> Maui’s Dolphin</td>
<td><strong>Title:</strong> The Hector’s Dolphin</td>
<td></td>
</tr>
<tr>
<td><strong>Summary:</strong> Describes the physical characteristics, behaviour and habitat of Maui’s dolphins and looks at the threats to their survival in the wild.</td>
<td><strong>Summary:</strong> Describes the physical characteristics, behaviour and habitat of Hector’s dolphins and looks at the threats to their survival in the wild.</td>
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<tr>
<td><strong>Suggested level:</strong> Junior, primary</td>
<td><strong>Suggested level:</strong> Junior, primary</td>
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<p>| Authors: Dawson, Stephen and Elisabeth Slooten                                      | Author: Atkinson, Tania                      |
| <strong>Title:</strong> Down-under Dolphins: The Story of Hector’s Dolphin                       | <strong>Title:</strong> Pelorus Jack: The Story of New Zealand’s Famous Dolphin |
| <strong>Summary:</strong> Discusses the habits and behaviour of the Hector’s dolphin and causes of accidental deaths by entanglement in gillnets. | <strong>Summary:</strong> The true story of Pelorus Jack, a dolphin who was a regular escort of the Wellington–Nelson steamers for 25 years until his disappearance in 1912. |
| <strong>Suggested level:</strong> Secondary                                                      | <strong>Suggested level:</strong> Primary, intermediate   |</p>
<table>
<thead>
<tr>
<th>Author: Todd, Barbara</th>
<th>Author: Graham, Julia</th>
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<tbody>
<tr>
<td>Title: Whales and Dolphins</td>
<td>Title: Opo the Happy Dolphin</td>
</tr>
<tr>
<td><strong>Summary:</strong> Describes the different types of whales and dolphins that live around New Zealand, including what they eat, where they travel, how they use techniques such as echolocation to find food and why they strand. Looks at the ways these mammals interact with each other and with humans, and what can be done to protect them. <strong>Suggested level:</strong> Primary, intermediate</td>
<td><strong>Summary:</strong> Opo rescues Captain Jack from a shark attack when he is washed overboard from his fishing boat. Opo then becomes a local celebrity at Opononi.</td>
</tr>
<tr>
<td>Author: Graham, Julia</td>
<td>Author: Lee-Johnson, Eric and Elizabeth Lee-Johnson</td>
</tr>
<tr>
<td>Title: Opo te Aihe Harikoa (Opo the Happy Dolphin)</td>
<td>Title: Opo: The Hokianga Dolphin</td>
</tr>
<tr>
<td><strong>Summary:</strong> Picture book for children in te reo Māori. Translation of Opo the Happy Dolphin. <strong>Suggested level:</strong> Primary, intermediate</td>
<td><strong>Summary:</strong> A photographic essay about Opo, the friendly dolphin who made the Hokianga Harbour her home, captured the hearts of the Hokianga people and became a major tourist attraction at Opononi during the summer of 1955–56.</td>
</tr>
</tbody>
</table>

**Studying dolphins**

<table>
<thead>
<tr>
<th>Author: Wallace, Karen</th>
<th>Author: Stephens, Jane</th>
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</thead>
<tbody>
<tr>
<td>Title: Diving Dolphin</td>
<td>Title: Dolphin</td>
</tr>
<tr>
<td><strong>Summary:</strong> A young dolphin’s life is full of adventure — can he escape the killer whales? <strong>Suggested level:</strong> Junior</td>
<td><strong>Summary:</strong> A poem that introduces the characteristics and behaviour of the dolphin. Also includes factual information about dolphins. <strong>Suggested level:</strong> Junior, primary</td>
</tr>
<tr>
<td>Author: Samuels, Amy</td>
<td>Author: Davies, Nicola</td>
</tr>
<tr>
<td>Title: Follow That Fin! Studying Dolphin Behaviour</td>
<td>Title: Dolphin: Habitats, Life Cycles, Food Chains, Threats</td>
</tr>
<tr>
<td><strong>Summary:</strong> Follows two biologists as they study the behaviour and everyday life of bottlenose dolphins in Shark Bay, Australia. <strong>Suggested level:</strong> Primary, intermediate</td>
<td><strong>Summary:</strong> Describes the habitat, physical characteristics, behaviour and life cycle of dolphins, as well as the threats they face and efforts to protect them. <strong>Suggested level:</strong> Primary, intermediate</td>
</tr>
<tr>
<td>Author: Davies, Nicola</td>
<td>Author: Houghton, Sue</td>
</tr>
<tr>
<td>Title: Wild About Dolphins</td>
<td>Title: Dolphin</td>
</tr>
<tr>
<td><strong>Summary:</strong> Describes searching for dolphins around Newfoundland and in the Indian Ocean on two scientific expeditions. Includes a guide to dolphin species. <strong>Suggested level:</strong> Junior, primary</td>
<td><strong>Summary:</strong> Describes some different species of dolphins and their physical characteristics and behaviour. <strong>Suggested level:</strong> Primary, intermediate</td>
</tr>
<tr>
<td>Author</td>
<td>Title</td>
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<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>Robinson, Claire</td>
<td>Dolphins</td>
</tr>
<tr>
<td>Dobbs, Horace E</td>
<td>Follow a Wild Dolphin: The Story of an Extraordinary Friendship</td>
</tr>
<tr>
<td>Cole, Melissa S</td>
<td>Dolphins</td>
</tr>
<tr>
<td>James, Sylvia M</td>
<td>Dolphins</td>
</tr>
<tr>
<td>Mead, James G</td>
<td>Whales and Dolphins in Question: The Smithsonian Answer Book</td>
</tr>
<tr>
<td>Renne</td>
<td>Little Dolphin’s Big Adventure</td>
</tr>
<tr>
<td>Pohatu, Warren</td>
<td>Mōkai Rangatira: Māori Animal Myths</td>
</tr>
<tr>
<td>Anderson, Lonzo</td>
<td>Arion and the Dolphins: Based on an Ancient Greek Legend</td>
</tr>
<tr>
<td>Dunlop, Beverley</td>
<td>The Dolphin Boy</td>
</tr>
<tr>
<td>Butterworth, Christine</td>
<td>The Sand Dolphin</td>
</tr>
<tr>
<td>Author: Benchley, Nathaniel</td>
<td>Author: Grover, Wayne</td>
</tr>
<tr>
<td>-----------------------------</td>
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</tr>
<tr>
<td>Title: The Several Tricks of Edgar Dolphin</td>
<td>Title: Dolphin Adventure: A True Story</td>
</tr>
<tr>
<td>Series: An I can read book</td>
<td>Summary: A diver describes how he encounters and gains the trust of a family of dolphins and saves the life of their baby.</td>
</tr>
<tr>
<td>Summary: Edgar was a clever young dolphin but he didn’t like to play his games in a small tank on the ship where he was captive.</td>
<td><strong>Suggested level</strong>: Primary</td>
</tr>
</tbody>
</table>

**School Journals**

<table>
<thead>
<tr>
<th>'Down for the count’ by Kathy White</th>
<th>‘A Tragedy at sea’ by Kathy White</th>
</tr>
</thead>
<tbody>
<tr>
<td>CN No. 3 2004 pgs 15-19</td>
<td>CN No. 3 2004 pgs 10-14</td>
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**Mammals**

<table>
<thead>
<tr>
<th>Author: Snedden, Robert</th>
<th>Author: Thomas, Peggy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title: What is a Mammal?</td>
<td>Title: Marine Mammal Preservation</td>
</tr>
<tr>
<td>Summary: Explains what mammals have in common with each other and what makes them different from other types of animals.</td>
<td>Summary: Looks at how man-made pollution, habitat destruction and shipping traffic are endangering marine mammals, and how scientists, government agencies and volunteers track down the offenders and endeavour to save the marine mammals’ lives.</td>
</tr>
<tr>
<td><strong>Suggested level</strong>: Intermediate, junior secondary</td>
<td><strong>Suggested level</strong>: Intermediate, secondary</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Author: Kalman, Bobbie and Jacqueline Langille</th>
<th>Author: Kalman, Bobbie</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title: What is a Marine Mammal?</td>
<td>Title: What is a Mammal?</td>
</tr>
<tr>
<td>Summary: Describes ways in which marine mammals have adapted to ocean habitats, including their physiology, reproductive behaviour, diet and other behaviour.</td>
<td>Summary: Introduces mammals, showing and describing the main groups and discussing their anatomy, habitats, reproduction and diet.</td>
</tr>
<tr>
<td><strong>Suggested level</strong>: Primary, intermediate</td>
<td><strong>Suggested level</strong>: Primary, intermediate</td>
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**Food chains**

<table>
<thead>
<tr>
<th>Author: Greenaway, Theresa</th>
<th>Author: Riley, Peter D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title: Food Chains</td>
<td>Title: Food Chains</td>
</tr>
<tr>
<td>Summary: Explains what food chains are, looks at how they work in a variety of habitats and discusses how humans disrupt natural food chains.</td>
<td>Summary: Introduces the basic science behind food chains and presents experiments to show how they work.</td>
</tr>
<tr>
<td><strong>Suggested level</strong>: Primary</td>
<td><strong>Suggested level</strong>: Primary, intermediate</td>
</tr>
<tr>
<td>Author: Lauber, Patricia</td>
<td>Author: Silverstein, Alvin</td>
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<tr>
<td>Title: Who Eats What? Food Chains and Food Webs</td>
<td>Title: Food Chains</td>
</tr>
<tr>
<td><strong>Summary:</strong> Explains the concept of a food chain and how plants, animals and humans are ecologically linked.</td>
<td><strong>Summary:</strong> Explains various components of a food chain and discusses the concepts of food webs, umbrella species, biogeochemical cycles and more.</td>
</tr>
<tr>
<td><strong>Series:</strong> Let's-read-and-find-out stage 2</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Author: Kalman, Bobbie and Jacqueline Langille</th>
<th>Author: Hickman, Pamela M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title: What are Food Chains and Webs?</td>
<td>Title: Hungry Animals: My First Look at a Food Chain</td>
</tr>
<tr>
<td><strong>Summary:</strong> A simple introduction to food chains and webs, featuring both herbivores and carnivores and discussing energy, food production and decomposition in various ecosystems.</td>
<td><strong>Summary:</strong> When Jill and her mother visit a field, they discover the fascinating cycle of nature – a food chain. Includes lift-the-flap pages, factual information and notes for parents.</td>
</tr>
<tr>
<td><strong>Suggested level:</strong> Primary</td>
<td><strong>Suggested level:</strong> Junior, primary</td>
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<table>
<thead>
<tr>
<th>Young people and the environment</th>
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</thead>
<tbody>
<tr>
<td>Author: Collard, Sneed B</td>
<td>Author: Leuzzi, Linda</td>
</tr>
<tr>
<td>Title: Acting for Nature: What Young People Around the World Have Done to Protect the Environment</td>
<td>Title: To the Young Environmentalist: Lives Dedicated to Preserving the Natural World</td>
</tr>
<tr>
<td><strong>Summary:</strong> Describes the efforts of 15 young people to protect the environment in their communities in different countries around the world.</td>
<td><strong>Summary:</strong> Well-known environmentalists from a variety of fields describe how they developed an interest in the environment, how they got where they are today and things to think about when considering a career that focuses on preserving and protecting the natural world.</td>
</tr>
<tr>
<td><strong>Suggested level:</strong> Intermediate, junior secondary</td>
<td><strong>Suggested level:</strong> Intermediate, junior secondary</td>
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<table>
<thead>
<tr>
<th>Resources available elsewhere</th>
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<tbody>
<tr>
<td>Author: Spilbury, Louise</td>
<td>Title: The Amazing Dolphin of Opononi (New Zealand)</td>
</tr>
<tr>
<td>Title: Taking Action! WWF</td>
<td>Details: Video recording, director Rudall Hayward</td>
</tr>
<tr>
<td>Publisher: Reed Educational and Professional Publishing, 2000.</td>
<td>Publisher: Auckland: Hayward Film Trust, c1991</td>
</tr>
<tr>
<td><strong>Summary:</strong> Look behind the scenes of WWF, the global environmental network, to get a real feel for how the organisation works and what it aims to achieve. Part of a series of books looking at the work being done around the world by people committed to a better future for the earth and its inhabitants.</td>
<td><strong>Summary:</strong> A documentary about Opo, the friendly lone dolphin who made the Hokianga Harbour her home for about two years and became a tourist attraction during the summer of 1955–56.</td>
</tr>
<tr>
<td></td>
<td><strong>Suggested level:</strong> Primary, intermediate, secondary</td>
</tr>
</tbody>
</table>
Title: Life’s a Beach: A Coastal Care Kit
Designed for Curriculum Levels 4–5

Summary: The kit includes a video, lesson plans, teacher notes and fact sheets.

Contact: The Environment Bay of Plenty regional council

Facts about Maui’s and Hector’s dolphins
- www.mauisdolphin.org.nz
- www.kcc.org.nz/animals/hectorsdolphin.asp
- www.sharkfriends.com/whales/hectors.html
- www.bbc.co.uk/nature/wildfacts/factfiles/82.shtml

Research into Maui’s and Hector’s dolphins
- www.otago.ac.nz/marinescience/mammals/home.htm

Other conservation organisations
- http://www.earthtrust.org/hector.html
- http://www.whaledolphintrust.org.nz

Local communities
- http://www.aoteamoana.co.nz/hectorhui/publish/

The government’s role in protecting Maui’s dolphin

The role of the Department of Conservation and the Marine Mammals Protection Act 1978

Marine mammal sanctuaries

The dolphin family
- http://animaldiversity.ummz.umich.edu/chordata/mammalia/cetacea/delphinidae.html
Appendix 1: Blank teacher-directed inquiry template

This template is designed to help teachers plan and carry out an inquiry with their class.

**PLANNING THE INQUIRY:**

<table>
<thead>
<tr>
<th>Topic:</th>
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<table>
<thead>
<tr>
<th>Concepts and conceptual understandings:</th>
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<table>
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<tr>
<th>Key competencies:</th>
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<thead>
<tr>
<th>Learning outcomes:</th>
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<td></td>
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</tbody>
</table>
Inquiry Stage One: Immersion

Inquiry Stage Two: Choosing and Using Information

Inquiry Stage Three: Coming to Our Conclusions

Inquiry Stage Four: Planning Our Action

Appendix 1: Blank teacher-directed inquiry template

This template is designed to help teachers plan and carry out an inquiry with their class.
Maui’s Dolphin – An Inquiry to Action

**Mainly grey body**

**Dorsal Fin**
- rounded
- black or dark grey

**Tail Fin**
- relatively large
- black or dark grey

**Pectoral Fin**
- small
- black or dark grey

**Beak or Rostrum**
- short
- black or dark grey at tip

**Grey forehead with thin black circle**

**White finger-like projections either side**

**Appendix 2: Photocopy masters**

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**Maui’s Dolphin**

*Cephalorhynchus hectori Maui*

Source: D Clement

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Activity: Maui’s Dolphin Life Cycle

Source: D Clement
Activity: Clever Clicks – Echolocation
**Activity: Pollution Quiz**

1. If you use both sides of a piece of paper before recycling it … + 5 points
2. If you picked up litter in a public place in the past week… + 5 points
3. If you let leaves or grass clippings decompose… + 5 points
4. If your family uses energy efficient appliances… + 5 points
5. If your family recycles aluminum cans… + 10 points
6. If your family recycles glass and plastics 1 and 2… + 10 points
7. If your family takes your own bags shopping… + 10 points
8. If your family has a vegetable garden… + 10 points
9. If you walked, rode a bike or used a bus in the last week… + 10 points
10. If your family planted 1 or more trees in the past year… + 10 points
11. If your family recycles newspaper and other paper… + 10 points
12. If your family helped an environmental issue in the past year… + 10 points
13. If you told someone about the issue above and what you did… + 10 points
14. If you left a light, TV or radio on in an empty room yesterday… - 5 points
15. If you littered in the past year… - 10 points
16. If your family burns or bags your leaves or grass clippings… - 10 points
17. If your family bought food packed in polystyrene in the last week… - 10 points
18. If your family always gets new plastic bags at the supermarket… - 20 points
19. If your family has put paint, chemicals or plastic down a drain… - 20 points
20. If your family has used a car to go less than two blocks… - 20 points

ADD and SUBTRACT all your family’s points (max = 110)

What 2 things could you change to reduce the pollution your family makes?

__________________________________________  ______________________________________
__________________________________________  ______________________________________