

RIVER VOICES

A SOCIAL INQUIRY





ACKNOWLEDGEMENTS

Production of this resource has only been possible with the generosity and goodwill of those people who gave freely of their time and experience to appear in the DVD clips. Special thanks to: Interviewers Fionn Cullinane and Ellen Turnbull; interviewees Emily Arthur, North Canterbury Fish & Game Council; Te Marino Lenihan, Ngāi Tahu, Ngāti Māmoa, Waitaha; Greg Byrnes, Environment Canterbury; Chris Sundstrum, North Canterbury Federated Farmers; Gerard Smyth, Frank Film; Robin Judkins; Ishbel Cullinane; Garth Brookland, Alpine Jet; and Peter Robinson.

Also many thanks to all of our advisors and reviewers who kindly provided help and feedback in the concept- and resource-development stages: Andrea Milligan, Isabel Browne, Ruth Mahupuku-Kelly and Martinborough School, Paul Adamson and Fernridge School, Penny Kerr-Hislop, Mike Taylor and Erana Hemmingson.

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Designed by Esther Chua, Thinkspace Design
The video clips were kindly filmed and edited by Jim Cullinane of Kahuna Ltd, www.kahuna.net.nz
DVD replication by Silver & Ballard, www.silverballard.co.nz
Teacher's notes printed by Graphic Press & Packaging, www.graphicpress.co.nz
Concept development, project management and production services by Lift Education, www.lifteducation.com



A LETTER TO TEACHERS

River Voices is an engaging new resource that uses a social-inquiry approach to explore the issues of environmental sustainability in New Zealand's rivers.

Fish & Game New Zealand have produced this resource to support and encourage young people to develop an awareness of the issues facing our freshwater environment. We are a public entity with a statutory responsibility for the management and enhancement of freshwater fishing and gamebird hunting. We receive no taxpayer funding; all revenue is generated by the sale of fishing and hunting licences. Our primary roles are the protection and improvement of freshwater habitats and of the public's access to them.

We are also eager to encourage students' engagement with our natural world. We support New Zealand's anglers and hunters to get young people engaged with the issues facing our freshwater environment. We recognise the need for students to be equipped to make decisions that will benefit themselves, their families, their communities and all future generations.

Fish & Game New Zealand are eager to acknowledge schools that are actively looking out for the environment, and to support them in their endeavours. If your students are involved

in protecting New Zealand's rivers, please let us know so that we can celebrate your achievements with you. You can contact us on (04) 499 4767 or at nzcouncil@fishandgame.org.nz.

We encourage you and your students to take up the challenge of learning about the environment, people's relationships with the environment and what things we can all do to make a difference.

Please visit our website, www.fishandgame.org.nz, or email nzcouncil@fishandgame.org.nz if you need further information.



Ric Cullinane
Communications and Marketing Manager
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INTRODUCTION

Nau mai, haere mai. Welcome to the *River Voices* resource!

What is the *River Voices* resource?

River Voices has been developed by teachers, advisors and educational publishers for Fish & Game New Zealand, who are making it available free for use in your classrooms. *River Voices* is designed to involve teachers and students in the study of waterways in New Zealand and to help them develop social-inquiry skills within the bigger context of environmental sustainability.

River Voices is an educational resource comprised of digital stories on a DVD and accompanying hard-copy teacher's notes. *River Voices* uses the Waimakariri River in Canterbury as an example to support learning about your local waterway within the framework of *The New Zealand Curriculum*. *River Voices* supports and encourages teachers and students to:

1. Understand the perspectives and values of a range of New Zealanders regarding a prominent New Zealand river, the Waimakariri.
2. Carry out a parallel inquiry, using a local waterway as a learning context.

The teacher's notes provide ideas for learning experiences and a list of background material and resources that may be used to support inquiry learning. The materials provided are not designed as



a prescribed learning programme or a stand-alone sequence of learning experiences, but are offered to teachers and students as supports for their inquiry. *River Voices* focuses on the social sciences learning area, though teachers should be aware of the potential for cross-curricula links, particularly in the fields of science, English and Education for Sustainability (EfS).

Why use rivers as a context for learning?

The resource:

- supports students through the inquiry process, with the aim of empowering them to take action in their own localities

- meets the objectives of *The New Zealand Curriculum*, while providing an authentic context for implementing an inquiry
- provides opportunities for schools to connect with the local community
- helps students to develop understanding about and ownership of problems with the management of natural resources, and introduces students to the ways they can influence change
- provides coherent opportunities for linking together the different learning areas of *The New Zealand Curriculum*.



CURRICULUM CONSIDERATIONS

Focuses of the resource

Vision¹

This resource focuses on students being:

- connected to the land and environment
- members of their communities
- actively involved in New Zealand's social, cultural, economic and environmental well-being
- lifelong learners, thinking critically and creatively, actively seeking and creating knowledge and making informed decisions.

Principles²

This resource fosters the principles of:

- community engagement
- coherence within and across learning areas
- future focus, encouraging students to consider the future by exploring issues such as sustainability
- 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 ōna tikanga.

Values³

This resource fosters the key values of:

- innovation, inquiry and curiosity, by asking students to think critically, creatively and reflectively

- community and participation for the common good
- ecological sustainability, which includes care for the environment.

Key competencies⁴

This resource fosters in students all five of *The New Zealand Curriculum* key competencies.

- **Thinking:** Students will use creative and critical processes to make sense of information, experiences and ideas. Most of the learning experiences in this resource encourage curiosity and require students to think critically about human activities and the impact of these activities on the natural world.
- **Using language, symbols and texts:** This competency is about students using language, symbols, numbers, images and technology to represent and communicate information, experiences and ideas. While studying local rivers, students will gain new understandings of words, symbols and texts used by people who work for organisations such as DOC and Fish & Game New Zealand. Students will also use various equipment (such as computers or apparatus used for experiments) when undertaking learning experiences.

- **Managing self:** Students will see themselves as capable learners, manage their own work, set goals and achieve them, be able to complete self-assessments and set themselves high standards. Students will explore their beliefs on a range of themes and develop an understanding of what drives their attitudes and values. Teachers and students reflect and evaluate their learning throughout the inquiry to deepen the learning and to map out next steps.
- **Relating to others:** Students will work together to come up with new approaches, ideas and ways of thinking. They will be asked to work together in groups for many of the learning experiences, to listen with respect to differing values and perspectives, and to make a positive contribution.
- **Participating and contributing:** Students will be working 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 water sustainability, and hearing perspectives from a range of stakeholders, they will begin to understand their roles and responsibilities in contributing to change.

¹ Ministry of Education, *The New Zealand Curriculum* (Wellington: Learning Media Ltd, 2007), 8.

² *Ibid.*, 9.

³ *Ibid.*, 10.

⁴ *Ibid.*, 12–13.

Learning areas

River Voices sits primarily within the social sciences learning area; however, a cross-curricula approach – especially with science, English and EFS – would be beneficial.

Achievement objectives

The following are some relevant achievement objectives from the social sciences learning area. Students will gain knowledge, skills and experience for the following levels.

Level 3

- Understand how people view and use places differently.
- Understand how people make decisions about access to and use of resources.
- Understand how cultural practices vary but reflect similar purposes.

Level 4

- Understand how exploration and innovation create opportunities and challenges for people, places and environments.
- Understand how formal and informal groups make decisions that impact on communities.
- Understand how people participate individually and collectively in response to community challenges.

Level 5

- Understand how economic decisions impact on people, communities and nations.
- Understand how people's management of resources impacts on environmental and social sustainability.
- Understand how people seek and have sought economic growth through business, enterprise and innovation.

The following are some relevant achievement objectives from the science learning area.

Levels 3 and 4

- Ecology: Students will explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human induced.
- Participating and contributing: Students will explore various aspects of an issue and make decisions about possible actions.
- Investigating in science: Students will build on prior experiences, working together to share and examine their own and others' knowledge.

Level 5

- Ecology: Students will investigate the interdependence of living things (including humans) in an ecosystem.

This resource can also lead to sustainability studies 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.
- 90811: Describe the consequences of human activity within a biophysical environment in relation to a sustainable future.
- 90815: Work co-operatively to develop and present a strategy or design for sustainability in response to a future scenario.



EDUCATION FOR SUSTAINABILITY

Education for Sustainability (EFS; previously known as environmental education) is a multidisciplinary approach to learning that incorporates an action component. This provides an opportunity for individuals and the community to take action to achieve sustainability.

In New Zealand, EFS involves the concepts of interdependence, sustainability, biodiversity⁵ and personal and social responsibility for action. These concepts underpin many of the issues that are discussed in this resource, and they highlight how

⁵ Ministry of Education, *Guidelines for Environmental Education in New Zealand Schools* (Wellington: Learning Media Ltd, 1999), 11.

our actions often upset the natural balance of the environment. We hope that this resource – the DVD, learning experiences and inquiry approach – will be used to examine the EfS concepts and to encourage further investigation into how our actions might need to change if we are to live in harmony with nature.

Key aspects of EfS within the context of this resource involve:

- Education about the environment: Learning about the rivers in New Zealand, the people who use them and the animals and plants that live in them.
- Education in the environment: Education in the river environment. Valuable learning comes from visiting local rivers and their surrounding environments.
- Education for the environment: Learning how to enhance river sustainability. This emphasises actions taken for environmental sustainability.

This resource incorporates the following senior secondary EfS strands:⁶

- Knowledge and understanding: Students develop a knowledge and understanding of sustainability as it relates to rivers and waterways.
- Attitudes and values: In the context of sustainability, students explore their own attitudes and values and those of others.
- Actions: Students participate in individual and co-operative actions to promote sustainability.



PEDAGOGICAL APPROACHES

The learning strategies offered in this resource are designed to encourage students to actively participate in their own learning. These strategies are inquiry learning, action learning, co-operative learning and experiential learning.

Inquiry learning

Inquiry learning is an effective pedagogy in EfS and social sciences, both of which are learning areas that encourage students to examine social issues, ideas and themes. Inquiry learning involves exploration of topics within contexts that are meaningful to students, where they ask questions and demonstrate their understanding of new learning. Students undertaking inquiries develop skills such as observation, reasoning and critical thinking, and a foundation from which they can evaluate their existing knowledge. During an inquiry, students develop skills to identify, examine, clarify and explore their own and others' value positions in relation to an issue. Through analysing these values and exploring the reasons behind the values held, students will develop a deeper understanding as to why people make certain decisions.

In the appendices, you will find a sample inquiry template, as well as a blank inquiry template taken from a social-inquiry model from the Ministry of Education.⁷

Action learning

Action is an integral part of EfS. Action learning employs inquiry-learning strategies with an emphasis on action and on reflection of the resulting changes. On page 13, we have provided a list of useful resources to help plan positive action.

Co-operative learning

Co-operative learning encourages students to work together in groups, helping to develop interpersonal skills and shared responsibility for learning. We have included various learning experiences that involve co-operative learning.

Experiential learning

Experiential learning offers students an experience from which new learning can emerge. This teaching strategy is employed in this resource.

⁶ For more information, see <http://seniorsecondary.tki.org.nz/Social-sciences/Education-for-sustainability>

⁷ Ministry of Education, *Building Conceptual Understandings in the Social Sciences: Approaches to Social Inquiry* (Wellington: Learning Media Ltd, 2008), 17.



WHOLE-SCHOOL APPROACH

Inquiring into your local river may involve a whole-school approach. This has been described as a process of change throughout a school to integrate sustainability principles across *all* aspects of school life. Many of the schools that have developed whole-school approaches to EfS have become enviroschools.⁸



SUPPORT AND CONSULTATION

Seeking support

Many local and regional councils have educators that schools can work with, and resources schools can use, to investigate and care for local environments. Some local and regional councils provide professional development for teachers. In many regions, there are sources of funding that schools can access to take action for the environment.

Māori consultation

Schools will benefit from developing a relationship with their local iwi or hapū to gain a greater understanding of Māori perspectives about local natural river environments.

We encourage your school to make contact with local iwi or hapū and discuss what you and your students are planning to do. Work together to find appropriate ways for Māori to share their knowledge, beliefs and the history of and skills and practices with the river

you are investigating. You may choose to work in partnership with local iwi or hapū to take action to care for the environment.



IDEAS FOR WATCHING THE DVD

Following a social-inquiry model, it is intended that the exploration of values and perspectives will be a key part of your inquiry. The DVD was developed to help students explore different values, viewpoints, value positions and perspectives. The interviewees on the DVD were asked to describe how they use and value the Waimakariri.

It is suggested you use the DVD either at the middle stage of your inquiry to support information gathering, or later in the inquiry to reinforce learning. Students would benefit from having some background knowledge of the issues around our freshwater environment, including the different perspectives of stakeholders, before watching the interviews.

We anticipate teachers will watch the interviews before sharing them with their class, as they will need to decide how and when they will use the DVD. Considered guidance of students through the reviewing process is essential.

Students could undertake a structured note-taking technique while watching the DVD. The DVD should be stopped periodically so that students can react to what they have observed.

Questions should be discussed before the DVD is played. Questions suited to levels 4–5 may include the following:

- What does the interviewee use the river for?
- How do they value the river?
- What does the interviewee tell us about river sustainability?
- What is the reasoning behind the interviewee's actions?
- What are the main points the interviewee made, and the literal meaning of these points?
- What do you think was omitted?
- What can I infer about their perspective from things other than their words, such as their manner? Their tone? Their body language? The setting?

Teachers may want to create wraparound statements upon which students can reflect. For example, 'The key ideas from each interview were...', 'If I had to describe the viewpoints of three of the stakeholders on this DVD, I would say...'. Teachers could encourage students to investigate the similarities and differences between each interviewee's ideas and viewpoints.

Understanding different perspectives is a new and challenging aspect of the social sciences. Support for understanding the values, views, value positions and perspectives is available in *Building Conceptual Understandings in the Social Sciences: Approaches to Social Inquiry*⁹ and *Social Studies in the New Zealand Curriculum*.¹⁰

⁸ For more information, see www.enviroschools.org.nz

⁹ Ministry of Education, *Building Conceptual Understandings in the Social Sciences: Approaches to Social Inquiry* (Wellington: Learning Media Ltd, 2008), 8–9.

¹⁰ Ministry of Education, *Social Studies in the New Zealand Curriculum* (Wellington: Learning Media Ltd, 1997), 21–22.



POSSIBLE LEARNING EXPERIENCES

This section will give some ideas for class discussions and inquiry-learning experiences that could be used before, during and after watching the DVD. These ideas are intended to extend students' understanding of the topic and to support a student through an inquiry process.

This resource has been developed with reference to *The New Zealand Curriculum*¹¹ and *Building Conceptual Understandings in the Social Sciences: Approaches to Social Inquiry*.¹² A social-inquiry approach, with three key phases, has been employed (see appendices I and II). The three phases are: Finding out information, Exploring values and perspectives, and Considering responses and decisions. These may overlap, or you may return to a particular phase, but they are all integral to the inquiry as a whole.

Reflection and evaluation should be ongoing throughout the social inquiry, and as a result of such a study, there should be opportunities for student-initiated social action.

The material in this section can be adapted for use at your particular year group or level. Each learning experience is labelled with applicable learning areas. Please use the resource list on pages 14–18 to support these learning experiences.

TIP: The language of a topic area can be a major barrier to learning for many students, so activities that identify (and possibly define) key terms in the inquiry are essential. There is a glossary, organised in relation to the digital stories, provided on page 21.

Activating prior knowledge

What we now know

Curriculum links: Social sciences, English and EfS

Materials could include the following:

- A selection of images relating to New Zealand's rivers. Images may include kids swimming in the river, farmers grazing cows near a riverbank or using the river to irrigate crops, people fishing or whitebaiting in the river, adventure tourism or a hydroelectricity dam.
- Some questions to accompany these images. Some of these questions should be provided by the students. Questions may include: How is this person using the river? How does this person's use of the river affect the river's ecology? How could they lessen any effects that their use may have on the river?

Display the images around the classroom. Have students work in groups, each group beginning at a different picture, and encourage them to look carefully at each image while considering the questions and recording their answers. When they have had sufficient time, call 'River rapids!', which is the signal to move on to the next picture. When all of the groups have looked at every picture, invite them to share their answers and ideas with the rest of the class. Put a time limit on the preparation and presentation.

You could ask the students:

- Are there similar or related ideas? Describe and record these.
- What seems to be the theme across each group of stakeholders?
- Are there any obvious gaps in our knowledge? Describe any gaps.

You could collate the information and ideas that arise from this exercise in the first two columns of a KWHL chart (what we **k**now, what we **w**ant to know, **h**ow we find out and what we **l**earned). You can revisit this chart periodically during the inquiry or review the chart as a summary activity in the final session. Ask the students to reflect: What surprised you about what we already know? What else would we like to know? How

¹¹ Ministry of Education, *The New Zealand Curriculum* (Wellington: Learning Media Ltd, 2007).

¹² Ministry of Education, *Building Conceptual Understandings in the Social Sciences: Approaches to Social Inquiry* (Wellington: Learning Media Ltd, 2008).

do you think this will help us? Did you consider what issues or problems New Zealand's rivers have?

Alternatively, using the images and questions above, draw a Venn diagram to compare groups of stakeholders (comparing two or three at a time is most effective). How do the needs of one stakeholder group cross over with the needs of another? What needs do not cross over? Are there any central needs that every group has?

Finding out about your local river

Curriculum links: Social sciences, English, EfS, mathematics and statistics, science and the arts

Encourage your students to find out about your local river or rivers. The following questions may be useful starting points.

- What is it called?
- What are the major issues it faces?
- How far does it stretch? Use maps and atlases to help you.
- What are the legends, poems, songs or books associated with the river?
- What do people use the river for?
- Why does it begin where it begins? And end where it ends? And take the form, shape or characteristics that it does?
- What is the importance of your local river to the local community?
- Who assesses the quality of the river? How do they do this?

- What is the quality of the water like? What is the reason for this?
- What are the physical features of the river?
- What makes your local river different from other rivers in New Zealand?

Find out further information about the river using books, photographs, the internet and members of your community.

Values continuum

Curriculum links: Social sciences, English and EfS

As a class, participate in a values-continuum activity. Mark the classroom out as a continuum, with one end of the room representing 'for' and the other end of the room representing 'against'. Read out the statements below and ask students to move to the place on the continuum that best represents their beliefs. Students will then be asked to explain their position.

Display a chart on the wall showing the continuum for each statement. Record each student's initials on the chart, as this activity could be revisited later in the unit.

Values continuum statements:

- Local waterways need to be protected.
- People should be involved in the care of their local environment.
- New Zealanders have always cared for their rivers, and do so 'naturally'.

Additional learning experiences for group inquiry

Please use the background information and resources list on pages 14–18 to support these learning experiences.

'Mubbles'

Curriculum links: Social sciences, English and EfS

Choose a current issue in New Zealand relating to water sustainability; for example, the highly debated proposed dam on the Hurunui River. Look at a website that outlines the argument and acknowledges perspectives of the chosen issue; for example, the Save the Hurunui website.¹³

Divide students into small groups of three or four. Their task is to read the information given on the website and then analyse the issue. For example, students might ask:

- How do different groups use the Hurunui River in Canterbury?
- What are the key issues with building a dam in the Hurunui River?
- Which groups want a dam in Hurunui and why?
- Which groups do not want a dam, and why not?
- What stakeholders will be affected by the decision to build a dam? Stakeholders could include recreational river users, farmers or local community members. Will you be affected?

¹³ <http://www.nzfishing.com/Issues/Hurunui.htm>

Allocate one of the affected stakeholder groups to each group of students. Students are to analyse the consequences of the decision to build the dam for that stakeholder group.

Hand out a giant speech bubble (mubble) to each group. Students write on the mubble what they think the stakeholders might be saying or thinking about the issue. Discuss possible reasons people hold so many different views on the use of natural resources.

Interpreting information

Curriculum links: Social sciences, English and EfS

Organise students into groups of four. Each student is to be given a newspaper article or cartoon illustrating a different perspective around the issue of river sustainability. Students read through the article by themselves and highlight the main points and concepts. Examine (using, for example, Edward de Bono's six thinking hats model¹⁴) a range of perspectives about the future of the river that arise from this exercise. Share newspaper articles and discussion ideas in groups as conclusions are drawn.

Charting change

Curriculum links: Social sciences, science, English, EfS, mathematics and statistics and the arts

In groups, create a chart to show how the development of technology has had an impact on rivers. For example, how has the use of various irrigation techniques within farming, or the development of dams for hydroelectricity, affected rivers' ecosystems or affected recreational river use?

Share each group's conclusions with the class. Record answers on charts or summary sheets for future reference and self-evaluation.

You may want to introduce students to a reflective journal. After each learning experience, students record their feelings and views related to their learning. It is to be an ongoing form of expression that they may or may not choose to share with other students. This could also be a place for students to record their conceptual understandings as, in social sciences, these are important ideas that teachers need to assess in relation to students' learning.

Persuasive writing

Curriculum links: Social sciences, English and EfS

Have students write a piece of persuasive writing¹⁵ that strongly expresses how they feel about one of these statements:

- Protecting and managing our rivers is the responsibility of all New Zealanders.
- Everyone should have the right to use rivers as they wish.

- Without access to rivers, our farming and future economic growth will suffer.
- Fish are a gift from Tangaroa, and should be treated as such.
- The health of the water, the land and people is linked.
- For New Zealand to maintain a 'clean, green' image, it must ensure its rivers are cared for.

Hot seating

Curriculum links: Social sciences, English, EfS and the arts

Hot seating is a drama tool that enables class members to interview one student playing the role of a protagonist. This learning experience helps to bring out further ideas and information about an issue, and to expose the attitudes of and towards the character that is 'hot seated'. In this context, the protagonist student takes on the role of one of the interviewees from the DVD and plays that 'character'. Watch the *River Voices* DVD and become familiar with the key points presented by each of the interviewees before doing this activity.

Advise the students that, to take on the role, they need to think as that person would think. This is not you thinking – it is the farmer, recreationalist, conservationist or city water user.

¹⁴ For more information, see http://www.mindtools.com/pages/article/newTED_07.htm

¹⁵ For information on persuasive writing indicators, see http://e-asttle.tki.org.nz/resources/teacher_resources#r1

Summarise the key points of the different perspectives and have the students write role-play cards. Students then answer questions about how their character's actions are having an impact on the river and about the motivation behind their actions.

Students need to consider the issues their character faces.

- What are their needs?
- What are they trying to achieve?
- What are their priorities?

Plan a trip to your local river

Curriculum links: Science, social sciences, English and the arts

Before your visit, have students:

- research the river; its history, ecosystem (including water quality and flow) and the culture surrounding it
- visualise and record what they expect to see.

During the visit, allow opportunities for students to:

- quietly observe; make lists; draw plants, animals and the many different parts of the environment and listen to and make a note of various sounds
- show respect for the natural and cultural environment while exploring it.

You may wish to monitor how clean the river is by taking samples to monitor the water quality.

When you return, students can:

- share what they recorded with the class
- share personal responses to the river
- write a story, poem, biography or song about the river and report it to the class
- list reasons why people should visit the river.

Water cycle

Curriculum links: Social sciences and science

Understanding the key stages of the water cycle is a good way to expand on students' understandings that planet earth consists of complex and finely balanced interacting systems. These systems affect and are affected by humans. By developing an understanding and appreciation of systems such as the water cycle, students become aware of how human activities can affect such systems. Visit Sciencelearn for instructions on how to simulate a water cycle.¹⁶ You could also look at how the Māori story of Ranginui and Papatūānuku explains the stages of the water cycle.¹⁷

Guest speakers

Curriculum links: Social sciences, English and EfS

For this topic, it is important to have some level of understanding of your local river; bringing a guest speaker into your class can help to achieve this.

Hearing different people's perspectives encourages students to gather information about why people view and use natural resources the way they do. Guest speakers could come from local or regional councils, local iwi or various community groups.

Te Tiriti o Waitangi

Curriculum links: Social sciences, English and EfS

Te Tiriti o Waitangi, The Treaty of Waitangi, guaranteed rangatiratanga, the right of tangata whenua to manage their land, forests, rivers and other treasures in accordance with tribal custom. This is stated in Article 2 of the treaty. Students should consider questions such as: How does this statement relate to rivers in New Zealand? Are there any other ideas in the treaty that are relevant to river care and sustainability? The Treaty 2 U website¹⁸ is a valuable and informative resource that provides tools to assist you in teaching the treaty.

Think Pair Share

Curriculum links: Social sciences, English and EfS

Complete a Think Pair Share activity. Here are some topics you could have students address.

- What are some historical reasons for waterway degradation?
- Why is the level of damage to rivers increasing?

¹⁶ <http://www.sciencelearn.net/sciencelearn/Contexts/H2O-On-the-Go/Teaching-and-Learning-Approaches/Building-a-water-cycle>

¹⁷ K. Penny, R. Romijn and S. Walker, *Take Action for Water* (Wellington: Greater Wellington Regional Council, 2008), 18.

¹⁸ <http://www.treaty2u.govt.nz/>

- What are the consequences of river degradation that New Zealand faces?
- How could we better manage our rivers? Who decides what actions to take?

Taking action

Curriculum links: Social sciences, English, EFS, mathematics and statistics, the arts, science, technology and health and physical education

The list below includes some ideas for students as to what actions they could take to encourage the sustainable use of their local waterway. Students should initially brainstorm their own ideas for how to take action and should use the list in this resource as a back-up. Possible actions include:

- Become an e-campaigner by starting a Facebook® page that expresses their opinion about a sustainability topic and inviting their friends to become involved in the cause.
- Write a report for a magazine. In their report, the student should outline how people view and use river resources differently and the consequences of this, and suggest some possible solutions.
- Write to or arrange to meet their local MP to discuss an issue.
- Make a submission to the local or regional council.
- Contact the media with a press release about a particular issue. This can be done by calling a reporter at a local newspaper or radio station or writing a letter to the editor for publication.

- Other ideas could be to run a consultation hui, adopt a river, put together a display for the community library, organise an information day for students' families, make a class collage, survey the local community, write letters, produce a play, write a song or slogan, organise and run a stall or display at a local event, and so on.

For ideas on planning for taking action, the following websites and resources could be helpful.

- The Enviroschools website¹⁹
- The Waiora resource²⁰
- The Take Action for Water website²¹
- The Greater Wellington Regional Council. Check out the Take Care website²² for contacts for stream restoration and coastal revegetation projects in your area. Your students and their families may wish to volunteer on these projects.

Suggested inquiry topics

There are many possibilities when it comes to choosing questions for good inquiry learning. We have included a few as ideas, but remember that, ideally, inquiry-learning questions should be generated by students to reflect their own passions and interests in and around the topic.

Threatened species

Why should we be concerned about the number of species under threat in our rivers, and what are the consequences for us if we do nothing?

Agriculture

How does agriculture affect rivers, and how can we resolve possible issues with the agricultural use of waterways?

Māori perspectives

What values and beliefs do some Māori have about the use of rivers?

Dams

How does the use of dams affect the ecosystems in rivers?

Conservation

What are people doing to conserve our rivers?

¹⁹ http://www.enviroschools.org.nz/our_organisation/how-it-works/action-learning-cycle

²⁰ For more information, see <http://www.envbop.govt.nz/Residents/Waiora-Healthy-Water.aspx>

²¹ <http://www.gw.govt.nz/take-action-for-water/>

²² <http://www.gw.govt.nz/takecare/>



BACKGROUND INFORMATION AND RESOURCES

Below is a variety of carefully selected resources to help teachers prepare students to undertake their own inquiry. Though there are a few extra sections, they are loosely organised to reflect the individual interviews. Please note that links and websites may change over time. The information below is accurate at time of print, so we apologise if you are unable to locate any of these references.

Māori perspectives

➔ **Title: Māori study rivers, estuary**

Publication information: *The Press*, Christchurch. 1 May 2007. Available from: http://findarticles.com/p/news-articles/press-the-christchurch-new-zealand/mi_8033/is_20070501/maori-study-rivers-estuary/ai_n43526744/

Level: Secondary

Description: Newspaper article about recent research by Māori in Canterbury into fish and plant life along rivers feeding into the Avon–Heathcote Estuary.

➔ **Title: Kore Para Aotearoa website**

Publication information: <http://www.converge.org.nz/kpa/>

Level: All

Description: A nationwide project to help develop sustainable kaitiakitanga (guardianship) of New Zealand's natural resources.

➔ **Title: Kaitiakitanga programme**

Publication information: <http://www.kaitiakitanga.net/>

Level: All

Description: A school environmental programme and network with a solid explanation of the concept of kaitiakitanga.

➔ **Title: Te Ara Encyclopedia, 'Kaitiakitanga' page**

Publication information: <http://www.teara.govt.nz/en/kaitiakitanga-guardianship-and-conservation>

Level: Upper primary and secondary

Description: A good overview of the concept of kaitiakitanga.

Fishing

➔ **Title: New Zealand Federation of Freshwater Anglers (NZFFA) website**

Publication information: <http://www.nzffa.net/>

Level: Secondary

Description: Provides an interesting perspective on waterways. See also the 'news' tab on the sidebar for relevant articles.

➔ **Title: River fishing website**

Publication information: <http://www.nzfishing.com/>

Level: Secondary

Description: Relevant information related to fishing in New Zealand, including river levels, weather, maps, fish types and fishing regulations.

Farming

➔ **Title: New Zealand Landcare Trust website**

Publication information: <http://www.landcare.org.nz/>

Level: Secondary

Description: An organisation promoting a sustainable approach to land management.

➔ **Title: Federated Farmers of New Zealand website**

Publication information: <http://www.fedfarm.org.nz/>

Level: Secondary

Description: The key perspective of this organisation of farmers is 'encouraging sustainability through best practice'.

Recreation

➔ **Title: Whitewater New Zealand website**

Publication information: <http://rivers.org.nz/conservation>

Level: Secondary

Description: Projects and details about how to preserve New Zealand's rivers and lakes for kayakers.

➔ **Title: Waimakariri River Regional Park website**

Publication information: <http://ecan.govt.nz/advice/recreation-and-parks/waimakariri-park/Pages/Default.aspx>

Level: Upper primary and secondary

Description: Information about the Waimakariri River Regional Park and links to the variety of activities it contains.

Sport

➔ **Title: Coast to Coast website**

Publication information: <http://www.coasttocoast.co.nz>

Level: Upper primary and secondary

Description: Information about the Speight's Coast to Coast multisport event.

Environment

➔ **Title: Dambusters website**

Publication information: <http://www.dambusters.co.nz/>

Level: Secondary

Description: Information about an organisation set up to protest against the development of dams in Canterbury. The organisation's aim is to protect natural waterways.

➔ **Title: TerraNature website, 'Media news' section**

Publication information: <http://www.terrannature.org/riversstreams.htm>

Level: Secondary

Description: A selection of articles questioning New Zealand's 'clean, green' image. More media links down the left-hand side of the page.

➔ **Title: Department of Conservation (DOC) website**

Publication information: <http://www.doc.govt.nz/>

Level: Upper primary

Description: News and resources based around water conservation, waterways and native freshwater fish.

➔ **Title: Canterbury's Wicked Water**

Publication information: Rodgers, M. 2009. Christchurch: CWW Solutions. Available to purchase from <http://www.completeangler.co.nz/tshirt-xidc61578.html>

Level: Secondary

Description: Highly informative book on what is happening to the water in Canterbury.

➔ **Title: Wai Care Stream Education and Assessment Resource**

Publication information: Available from <http://nwp.rsnz.org/resources/StreamKit/>

Level: Secondary

Description: Resource that uses local streams as a context for exploring the key dimensions of environmental education.

➔ **Title: Environmental Monitoring and Action Project (EMAP) website**

Publication information: <http://www.emap.rsnz.org/>

Level: All

Description: Comprises resources and programmes around the awareness of water issues.

➔ **Title: New Zealand Association for Environmental Education (NZAAE) website**

Publication information: <http://www.nzaee.org.nz/>

Level: Secondary

Description: Resources and programmes for environmental education.

➔ **Title: 'Like a fish out of water': Life in a disappearing river**

Publication information: Kelly, D., A. Davey and G. James. 2006. In *Water & Atmosphere*, 14(1): 18–19. Available from <http://www.niwa.co.nz/news-and-publications/publications/all/wa/14-1/river>

Level: Secondary

Description: Article on how fish survive when a river keeps disappearing.

➔ **Title: Whitebait Connection website**

Publication information: <http://whitebaitconnection.co.nz>

Level: Middle primary to secondary

Description: An action-based environmental education programme with great resources.

➔ **Title: Rivers and Us programme**

Publication information: <http://www.ew.govt.nz/For-schools/Resources-for-teachers/Classroom-units/Rivers-and-us/>

Level: Primary

Description: A unit looking at the ways we use water and the effect these activities have on the Waikato region's waterways.

➔ **Title: Wetlands resource**

Publication information: Department of Conservation. 2004. Wellington: Learning Media. Available from <http://www.doc.govt.nz/upload/documents/getting-involved/students-and-teachers/field-trips-by-region/wetlands-resource.pdf>

Level: Upper primary

Description: A resource designed to help teachers plan exciting and educational conservation learning experiences, based on West Coast wetlands.

➔ **Title: Cry me a river**

Publication information: White, M. In *North & South*, April 2010: 52–70.

Level: Upper primary and secondary

Description: An article about the uses of rivers in New Zealand and the importance of protecting them. If this issue of the magazine has gone out of print, please contact your local library or email northsouth@acpmagazines.co.nz to source a copy.

➔ **Title: River Life resource**

Publication information: Department of Conservation. 2010. Christchurch: Department of Conservation. Available from <http://www.doc.govt.nz/upload/documents/getting-involved/students-and-teachers/themes/river-life/braided-rivers-teachers-notes.pdf>

Level: All

Description: A resource focusing on the ecology of braided rivers.

Fish and game

➔ **Title: Fish & Game youth page**

Publication information: <http://www.fishandgame.org.nz/Site/Youth/default.aspx>

Level: All

Description: Resources and background information around issues of fishing and waterways.

➔ **Title: Fish & Game's Environmental Game Plan kit**

Publication information: Available to order from <http://www.fishandgame.org.nz/Site/Youth/EduKits.aspx>

Level: Upper Primary

Description: Environmental education kit that contains a teacher's manual, activity cards, a DVD and other materials.

➔ **Title: The Reed Field Guide to New Zealand Freshwater Fishes**

Publication information: McDowall, R. M. 2000. Auckland: Reed Publishing.

Level: Secondary

Description: Useful reference for freshwater fishes.

Extra science resources

➔ **Title: Stream Health Monitoring and Assessment Kit (SHMAK)**

Publication information: NIWA and New Zealand Landcare Trust. (2002). Wellington: Privately published. Available for purchase from <http://www.niwa.co.nz/our-science/freshwater/tools/shmak>

Level: Secondary

Description: A kit produced by NIWA and NZ Landcare Trust to allow non-scientists to collect accurate information from waterways and use it to make assessments of stream health.

➔ **Title: Stream Sense programme**

Publication information: <http://www.ew.govt.nz/For-schools/Resources-for-teachers/Classroom-units/Stream-sense/>

Level: Secondary

Description: A water-quality catchment monitoring programme for years 9–13.

➔ **Title: National Institute of Water and Atmospheric research (NIWA) website**

Publication information: <http://www.niwa.co.nz>

Level: Secondary

Description: News and resources around issues of water. See especially the 'freshwater' page.

➔ **Title: Science Learning Hub website**

Publication information: <http://www.sciencelearn.org.nz/>

Level: Upper primary and secondary

Description: This website explores New Zealand's world-class research and science and technology sectors and provides resources to support fresh thinking in science teaching and learning in our schools.

➔ **Title: Waterways: How Rivers and Streams Work**

Publication information: Quinn, P. 2000. Wellington: Ministry of Education and Learning Media.

Level: Primary

Description: Part of the *Building Science Concepts* series. Informative text about how waterways are formed and what they do.

Safety

➔ **Title: RiverSafe programme**

Publication information: Water Safety New Zealand. Available from <http://www.watersafety.org.nz/resource-orders/>

Level: Upper primary and secondary

Description: Free programme of DVDs and print materials that are based around river safety.

➔ **Title: Education Outside the Classroom (EOTC) Guidelines: Bringing the Curriculum Alive**

Publication information: Ministry of Education. 2009. Wellington: Learning Media.

Level: For teachers

Description: Ministry of Education framework for education outside the classroom.

➔ **Title: New Zealand Environmental Care Code**

Publication information: <http://www.doc.govt.nz/upload/documents/parks-and-recreation/plan-and-prepare/environmental-care-code/environmental-care-code-checklist.pdf>

Level: All

Description: Basic guidelines to follow for safety in and caring for the environment.

Online learning games

➔ **Title: Watershed game**

Publication information: <http://www.bellmuseum.org/distancelearning/watershed/watershed2.html>

Level: All

Description: An online interactive watershed game for students to play. Students make choices and see how they affect the watershed. There are two levels – novice and intermediate. The game has good instructions and visuals.

➔ **Title: Catchment detox**

Publication information: <http://catchmentdetox.net.au/>

Level: Secondary

Description: An online game that enables students to control the management of a river catchment for 100 years.

➔ **Title: Up the Creek resource**

Publication information: <http://www.biodiversity.govt.nz/kids/>

Level: Upper primary

Description: Bilingual interactive resource that introduces concepts about biodiversity in waterways by focusing on the lifecycle of whitebait.

Miscellaneous

➤ **Title: Learning Experiences Outside the Classroom (LEARNZ) website**

Publication information: <http://www.learnz.org.nz>

Level: All

Description: Virtual field trips to locations all around New Zealand. Many are linked to *The New Zealand Curriculum* and NCEA assessment.

➤ **Title: Local Government New Zealand website**

Publication information: <http://www.lgnz.co.nz/lg-sector/maps/>

Level: Upper primary and secondary

Description: A comprehensive list of links to council websites.

➤ **Title: Spinning a Line: New Zealand Writing about Fishing**

Publication information: Marshall, O., ed. 2001. Auckland: Random House.

Level: Secondary

Description: A book of short stories and poems about fishing. Includes work by writers such as Keri Hulme and James K. Baxter.

➤ **Title: Environment Canterbury website, 'Maps of the Canterbury region' page**

Publication information: <http://ecan.govt.nz/services/online-services/Pages/maps-canterbury-region.aspx>

Level: Secondary

Description: A selection of maps of the Canterbury region.

➤ **Title: Forest and Bird website**

Publication information: <http://www.forestandbird.org.nz>

Level: Middle primary to secondary

Description: Has articles about many different rivers, as well as beautiful photos. Also addresses key issues for rivers, such as agriculture and hydroelectric schemes. See especially articles under the 'freshwater' and 'saving our environment' side tabs.

➤ **Title: Ministry for the Environment website, 'Water publications' page**

Publication information: <http://www.mfe.govt.nz/publications/water/>

Level: Secondary

Description: Resource list for Ministry for the Environment publications on water and waterways.

➤ **Title: Sea Keepers website**

Publication information: <http://www.seakeepers-nz.com>

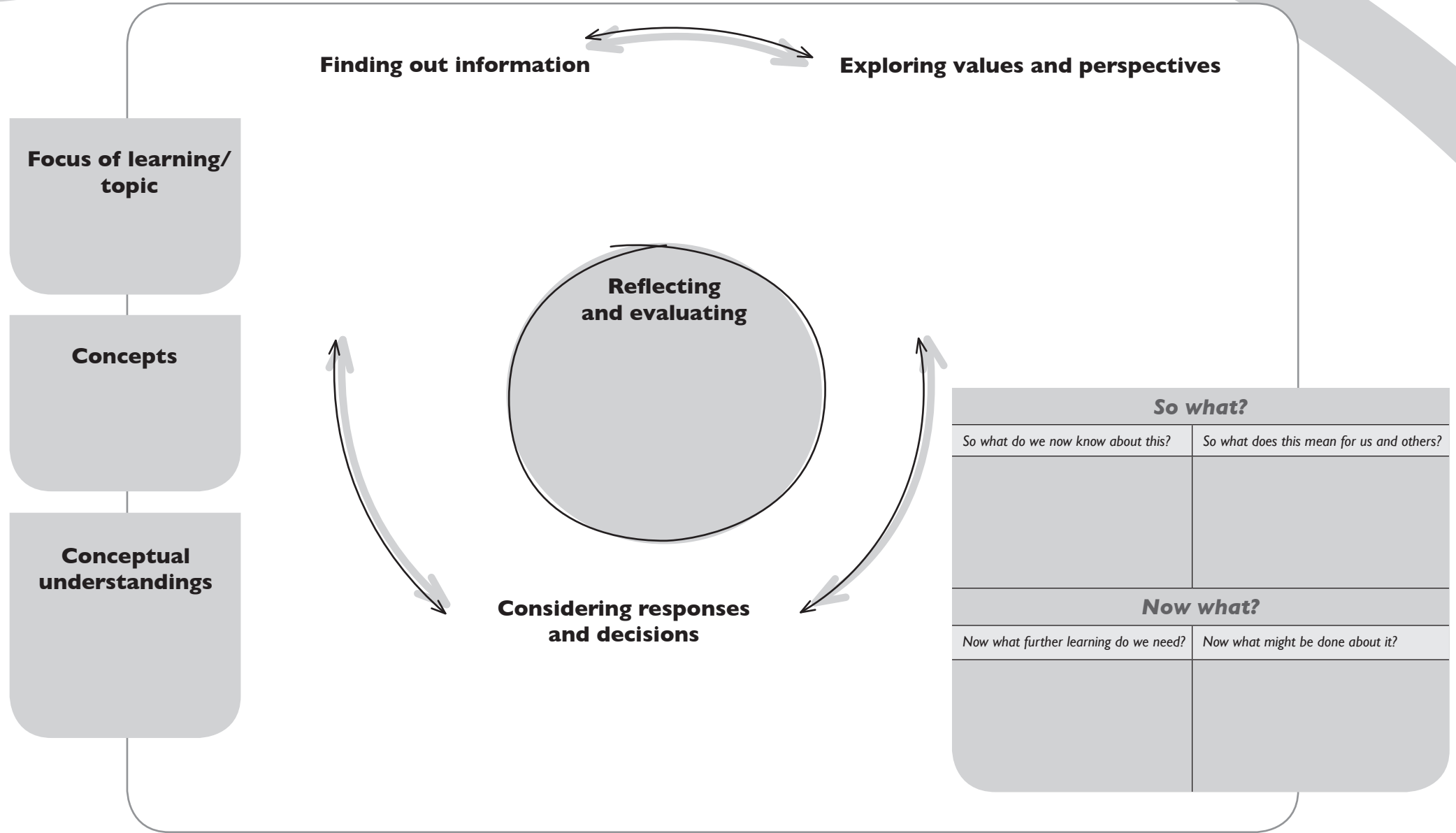
Level: Upper primary and secondary

Description: A resource that gives an overview of how we use water and the harm we do. Also includes specific activities.



APPENDIX I

Blank social-inquiry template



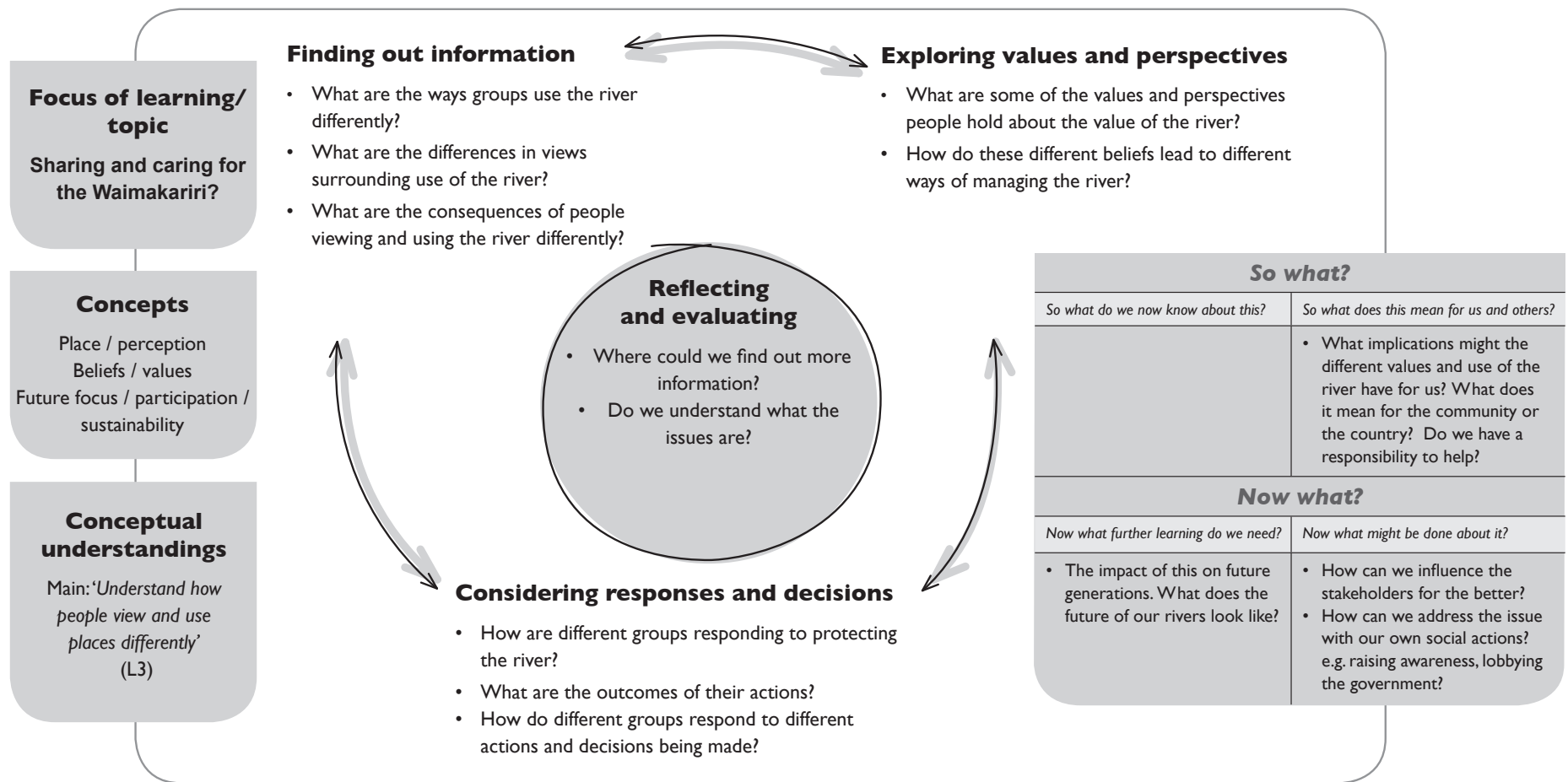
APPENDIX II

Below is an overview of how a teacher developed this unit using the social-inquiry process at level 3. The inquiry focuses on the conceptual understanding: 'Students will gain knowledge, skills and experience to understand how different people view and use places differently'. A context has been chosen to explore this conceptual understanding: 'Sharing and caring for the Waimakariri?'

You can select and adapt ideas from this example to develop your own programme that meets the needs of your students, community and school programme.

Sample inquiry approach

Sharing and caring for the Waimakariri?





GLOSSARY

My river, my mountain

Fundamental: Basic; central

Habitat: The environment or place where an animal or plant normally lives or grows

Organic: Developing naturally

Organic farming: Farming using only natural fertilisers or pesticides, made from animals or plants, not human-made chemicals

Pollute (rivers, water): Put harmful (toxic or poisonous) substances into the water; make the water unclean

The big event

Agriculture: Farming

Braided (river): A river with wide shingle beds, many snaking water channels and highly variable flows. Braided rivers provide a unique habitat for several of New Zealand's endangered wildlife species

Coast to Coast: A well-known race where competitors run, bike and kayak from Kumara Beach on the west coast of the South Island, over the Southern Alps, to Sumner Beach in Christchurch on the east coast of the South Island

Comparable: Similar to; can be fairly compared to

Detrimental: Bad; harmful

Founder: A person who started something

Misuse: Abuse; exploit; waste

Mitigate: Reduce or lessen the effects of something

Permit: Allow something

Pristine: Unspoilt

Rainfall: Amount of rain that falls in a specific location (usually measured each year)

Recreation: Sport; fun; relaxation

River course: Where a river flows

Counting on fish?

Advocate: Publicly encourage or support an idea, course of action or behaviour

Angler: Fisher

Caddis-fly: A small moth-like insect. Trout eat caddis-flies and their larvae

Detrimental: Bad; harmful

Gamebirds: Birds that are caught by recreational hunters, but can be hunted only in certain circumstances. Under the Wildlife Act 1953, includes mallard and grey ducks, paradise shelducks, Canada geese, pheasants and quail

Intensive farming: Farming in a small area; using a large amount of resources for the land area

Introduced (species): Plant or animal that did not originate in New Zealand; brought to New Zealand by people

Larva: Young insects in a grub-like form

Livestock: Farmed animals – cows, sheep, pigs, and so on

Resource: A source of help or information; a means of producing or doing something

Sports fish: Fish, such as trout and salmon, that are caught by recreational or sports fishers

Terrestrial: Land based (as opposed to water based)

Vegetation: Plants – trees, grass, shrubs, and so on

Water clarity: How clear the water is

Wetlands: An area of land soaked with water, such as a swamp, marsh or bog; can be covered in water, like a pond, or just muddy. Wetlands are the most biologically diverse of all ecosystems

Fun on the river

Braided river: A river with wide shingle beds, many snaking water channels and highly variable flows. Braided rivers provide a unique habitat for several of New Zealand's endangered wildlife species

Commercial: For money

Gorge: Steep-sided river channel

Untamed: Wild; unmodified; left in its natural state

A fisherman's story

Angler: Fisher

Fishery: Area or place that contains fish

Flow: The amount of water coming down the river

Flushes: Floods; high river levels

Imitate: Copy; act like

Migrate: To relocate from one place to another at a specific time of the year

Nutrient run-off: Excess fertiliser or animal waste containing nutrients that is washed off the land into rivers and lakes

Smelt: A species of small fish

Variability: Level of change or variation

Town and country

Aquifer: An underground layer of rock (or sand, silt, gravel or clay) that contains large amounts of water. The water can be taken from the rock, using a well, and used by humans

Climate: Weather

Constructive: Helpful; positive

Drought: Lack of rain over a long time

Hygiene: Cleanliness; being clean

Rectify: Fix; repair

Run-off: Pollution being washed off the land and into rivers

From the land

Aquifer: An underground layer of rock (or sand, silt, gravel or clay) that contains large amounts of water. The water can be taken from the rock, using a well, and used by humans

Centre-pivot irrigator: A big sprinkler used by farmers to irrigate land

Extensive farming: Farming over a wide area; uses few resources for the land area

Industry: Organised commercial activity; processing; manufacturing; farming

Intensive farming: Farming in a small area; using a large amount of resources for the land area

Irrigation: Watering pasture or crops

Pasture: Grass or grasslands for stock to graze on

Produce: Make; create; grow

Reduced: Lessened

Silt: Very fine sand and dust

Stock: Livestock; farmed animals – cows, sheep, pigs, and so on

Storage (water): Dams or ponds holding water to be used for irrigation in dry periods

Summer dries: Period in the summer when there is less rain

Sustainable: Able to be maintained; able to keep going

Water races: Canals or drains that carry water to farms and paddocks for irrigation

Where's the balance?

Community: A group of people who live in the same area

Economy: The production and use of goods and services of a community or nation as a whole

Nature reserve: A managed and protected area of land

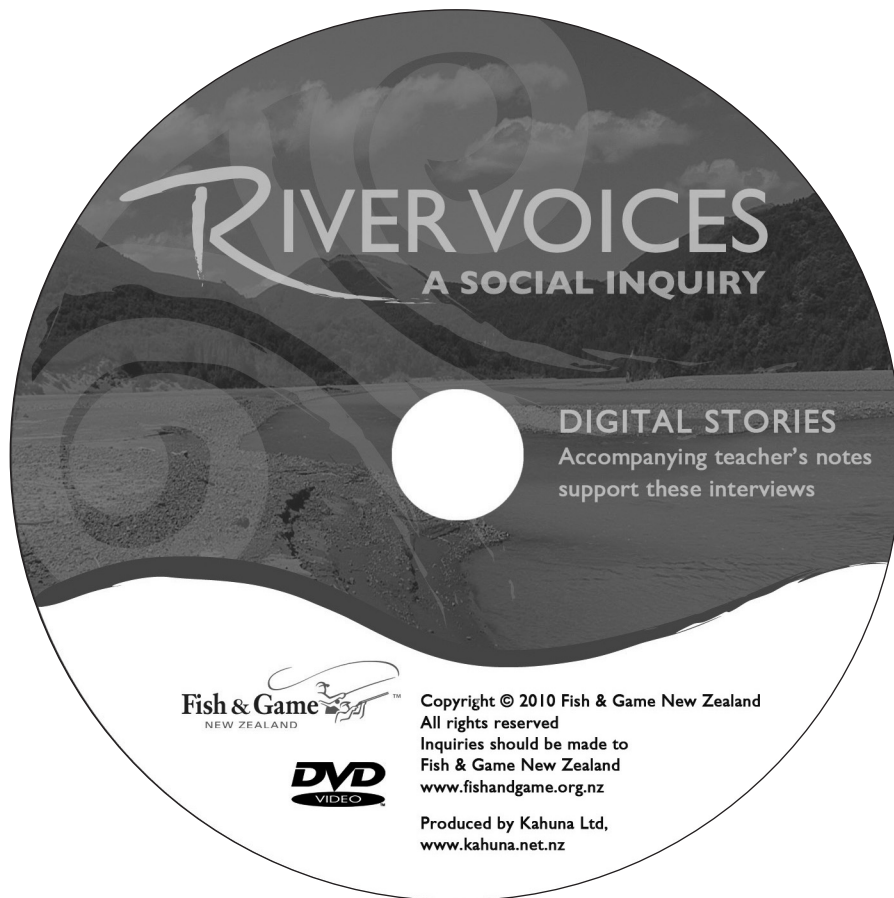
Last waters?

Breed: Reproduce; have offspring or children

Ecology: The relationship a living thing has with its environment; studying these relationships

Global warming: An increase in the world's temperatures

Whitebaiters: People who fish for whitebait



Summary of digital stories

Te Marino Lenihan of Ngāi Tahu, Ngāti Māmoē, Waitaha explains the significance to Māori of the Waimakariri River.

Robin Judkins, the founder of the Speight's Coast to Coast, discusses what effect recreational users have on the river.

Emily Arthur, an officer for Fish & Game New Zealand, takes a walk into the shallows of a side stream and shows what can be found there.

Garth Brookland is a jetboat driver on the Waimakariri. He reminisces on what the river used to be like and the changes that have occurred.

Peter Robinson, a fisherman, shows how to catch a fish and explains why water quality is so important.

Ishbel Cullinane is a student in Christchurch, and wonders why she needs to be so careful about her water usage.

Chris Sundstrum is a Canterbury farmer who needs and uses the river for his livelihood and for the good of the economy.

Greg Byrns is a representative for Environment Canterbury. He outlines some of the major uses of the river and the different ways these uses affect it.

Gerard Smyth, a filmmaker, is making a documentary about the Waimakariri. He mentions why it is so incredible and some of the dangers it faces.

