Education for sustainability teaching and learning guide

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What's new – May 2015

Updated sections

- Key concepts
- EFS and national qualifications: Reviewed standards
- Learning objectives – level 7 & 8
- Learning programme design
- Resources

What is education for sustainability about?

Education for sustainability (EfS) is about learning to think and act in ways that safeguard the well-being of people and the planet.

In EfS, students explore the relationship between people and the environment. They learn about the environmental, social, cultural, and economic aspects of sustainability. They learn to show leadership by example and to contribute to collective decisions that lead to actions for a sustainable future.

People can have very different views on sustainability. In EfS, students explore and evaluate different perspectives, rethink long-standing ideas, and consider alternative practices and directions. With the support of their teacher, they can take ownership of their learning and create new knowledge.

EfS is best taught collaboratively in conjunction with other subjects and supported by school and community policies and practices. Students then learn that no single area has a monopoly on solutions to complex issues. They also discover the power of partnerships, of working together.

> Mō tātou te Taiao ko te Atawhai
> Mō tātou te Taiao ko te Oranga
> It is for us to care for the environment to ensure its well-being
> In doing so we ensure our own well-being and that of future generations
>
> http://efs.tki.org.nz/Toitū-te-Ao-Carving

EfS has its foundations in environmental education. See Guidelines for Environmental Education in New Zealand Schools (Ministry of Education, 1999).

- Read three perspectives on a sustainable future

Education for sustainability curriculum guide content

Use the links below to access the sections of this guide. To navigate through the guide's web pages, select from the section and sub-section menu in the left-hand navigation.

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To print individual pages, select the 'Print' button at the top right of each page.

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What does sustainability mean?

People can have very different views on sustainability. Here are three:

A United Nations perspective

The United Nations Report of the World Commission on Environment and Development, Our Common Future (1987), describes a sustainable future as one where people are able to meet their needs environmentally, socially, culturally, politically, and economically without compromising the ability of future generations to meet their needs and aspirations (chapter 2, section 1).

A Māori perspective

From a Māori perspective, everything is connected: land, sea, and air. Relationships among people and relationships between people and the environment are all part of this larger whole. People have a kaitiaki/guardian responsibility for the natural environment. See Grant Hawke, ' The Holistic Approach' and 'Māori and Sustainable Development', Landcare Research (2008).

> Ko te oranga taiao, he oranga tangata.
>
> A healthy environment is a healthy people.

A business perspective

Businesses often see sustainability in terms of being able to survive and grow. But their products and services depend ultimately on social and environmental resources. Increasingly, businesses are responding to customer demands that they be environmentally responsible and that they commit themselves to sustainable practices.

A shared responsibility

All perspectives on sustainability are responses to complex issues and reflect the values and knowledge of the people who hold them. EfS teachers and learners grapple with this multiplicity of views and understandings.

We all have responsibility for creating our future. It is only by sharing our knowledge, skills, and viewpoints that we are able to refine goals – personal, school, and community – and generate the fresh thinking needed to solve problems.

> What a great time to be alive! Because this generation gets to essentially completely change the world.
>
> Paul Hawken, Ecologist, 6 August 2008

Rationale

Why study education for sustainability?

We depend on the environment for everything.

One way or another, the opportunities that we have – or will ever have – come back to the environment. So how we treat our environment is of great importance. EfS challenges students to develop the kinds of thinking and behaviours that will secure the future.

As New Zealanders, we are proud of our natural heritage.

We like to think of our country as ‘clean and green’. But many of our practices put the environment and all its inhabitants at risk. In EfS, students learn to investigate such practices and to advocate for change.

What we do today has consequences for future generations.

Our everyday actions help shape the kind of earth that we hand on to our children. By investigating how people’s actions have created the sustainability issues that confront us now, EfS students learn to make informed decisions about how to live their own lives.

In EfS, students develop valuable, transferable skills.

EfS empowers students to:

- think critically and creatively about issues and solutions
- view the world from different perspectives, particularly those that are directly relevant to Aotearoa New Zealand
- negotiate complexity and deal with change and uncertainty
- be confident, connected, lifelong learners with a sense of responsibility for the well-being of their country and the planet
- connect thinking and actions in ways that will lead to a sustainable future – environmental, social, cultural, and economic.

EfS opens up pathways to a variety of careers with a sustainability focus.
Sustainability means enough for all, forever.

Key concepts

Key concepts are the big ideas and understandings that we hope will remain with our students long after they have left school.

The following are the key concepts/big ideas in EfS.

Sustainability

Sustainability is about individuals, groups, and societies adopting ways of thinking and behaving that allow them to meet their needs and aspirations without preventing future generations of all living things from meeting theirs.

Systems thinking, with a future focus, enables decision-making for sustainability. In thinking and behaving for sustainability, there are four aspects to consider, environmental, social, cultural and economic.

- Aspects of sustainability

Equity

Equity is about fairness. In considering the four aspects of sustainability, it incorporates respect for all life, social justice, intergenerational fairness, and the fair management of finite resources.

- Concepts that relate to equity

Interdependence

Interdependence is about the interconnectedness of people and environments. This interconnectedness can be understood through considering ecosystems, community, cultural diversity, democracy, and fair trade.

- Concepts that relate to interdependence

Responsibility for action

Personal and social actions are required to live sustainably. Actions for sustainability include: guardianship or kaitiakitanga, citizenship, having an action orientation, informed decision-making, resilience and regeneration, thoughtful consumerism, and enterprise and entrepreneurship.

- Concepts that relate to responsibility for action

What are key concepts?

Key concepts are the ideas and understandings that we hope will remain with our students long after they have left school. Key concepts sit above context but find their way into every context.

Students need time and opportunity to explore these concepts; to appreciate the breadth, depth, and subtlety of meaning that attaches to them; to learn that different people view them from different perspectives; and to understand that meaning is not static. By approaching these concepts in different ways and by revisiting them in different contexts within a relatively short time span, students come to refine and embed understandings.

For further information, see Approaches to building conceptual understandings at Social Sciences Online.

Return to previous page

Aspects of sustainability

Sustainability requires consideration of four aspects (sometimes also known as perspectives, pillars).

The four aspects

While all four aspects of sustainability are important, environmental sustainable is fundamental to the kaitiakitanga of our environment.

Environmental – this aspect acknowledges the need to enhance and maintain the biophysical systems that sustain all life on Earth. It includes the structure and function of natural ecosystems and the interactions between them and people, and calls for guardianship/kaitiakitanga of our environment.

Social – this aspect acknowledges the need for equity within and between generations, and within and between ethnic and social groups. It is inclusive of people's mental and physical well-being and the cohesion of their communities based on a fair distribution of resources.

Cultural – this aspect acknowledges the need to nourish and share attitudes and values that represent diverse worldviews, and the political need for all people to express their views freely and to participate in decision-making. Addressing these needs can build resilience for the future.

Economic – this aspect acknowledges the interactions of humans with the natural environment in using resources to create goods and services which add value to their lives. It acknowledges the resource use and waste disposal must occur within the capacity of our planet. It encourages a fair trading system that equitably distributes benefits and costs. It further encourages innovation and creativity in developments that lead to a sustainable future.

An integrative model

A model showing how these aspects are related (in this model, the social and cultural aspects sit within society).

Figure 1.1: Strong sustainability

(Source: See Change – Learning and Education for Sustainability, p.15)

There are many different models which show how these aspects are related. This model shows how our economy is a subset of our society, as in reality it is situated entirely within our society. It

also shows that everything in our economy and everything in our society is situated within, and entirely dependent on, our environment. This relationship means that any impact or change to our environment will impact on society and the economy, and therefore that any sustainability-related issue must be considered holistically, and recognise this interdependence. For example, a unit on oceans as a sustainable resource might consider the marine ecosystem and how people affect it through fishing and pollution (as in science), the socio-cultural aspects of seafood harvesting (as in geography), and the economic impact of fishing and tourism (economics).

Within subject disciplines one aspect may well be foregrounded in teaching and learning of a sustainability issue, but the other aspects must also be considered to support informed and considered action as an outcome. Where possible, teachers from different subject areas should be invited to share their relevant specialist knowledge. Alternatively, a cross-disciplinary approach can be used where teachers from the different disciplines co-teach the unit (or possibly a whole course).

Return to previous page

Concepts that relate to equity

Equity is a complex concept with other concepts sitting inside it. These other concepts are described in relation to the appropriate aspects of sustainability:

Respect for all life (environmental)

We have a responsibility to all species, not only because our existence is intertwined with theirs, but also because ecological justice dictates that all species have a right to life and to an environment that will sustain them.

Social justice (social)

Individuals and groups, regardless of their location, gender or ethnicity should have equal opportunities in relation to rights, resources, and services. They should also recognise that they have responsibilities.

Intergenerational equity (social)

Each successive generation should have the opportunity to determine its own future and to provide for it, and not be burdened by the actions of previous generations.

Finite resources (economic)

Earth’s resources are finite and are therefore limited. These resources can only be consumed at a rate at which they can be renewed, re-used or recycled, and, if there is no other alternative, disposed of in ways that minimise impact on the environment.

Return to previous page

Concepts that relate to interdependence

Interdependence is a complex concept with other concepts sitting inside it. These other concepts are described in relation to the four aspects of sustainability.

Ecosystem (environmental)

An ecosystem is all living things and physical features that are part of a network of interactions in an environment (for example, forest, wetland, suburban park). A healthy ecosystem relies on biodiversity (a range of different species) to function and to provide services (for example, food, clean water) to humans and other species.

Community (social)

A community is a group of people who interact with one another and develop partnerships in ways that contribute to collective well-being.

Cultural diversity (cultural)

Cultural diversity encompasses the diverse worldviews that inform different ways of thinking, valuing and behaving that can affect actions for a sustainable future.

Democracy (cultural)

Democracy refers to political systems where people are able to express their views freely and to participate in decision-making. Collective decision-making that supports sustainability occurs by consensus so that all members of the community feel ownership of the decision.

Fair trade (economic)

Fair trade refers to the exchange of goods and services that equitably distributes benefits and costs. Mechanisms for trade exist that allow for goods and services to be freely exchanged both within the capacity of the region or planet and in ways that minimise impacts on the environment.

Return to previous page

Concepts that relate to responsibility for action

Responsibility for action is a complex concept with other concepts sitting inside it. These other concepts are described in relation to the four aspects of sustainability:

Guardianship/kaitiakitanga (environmental)

Guardianship/kaitiakitanga is about individuals and communities acting together in diverse ways for the well-being of the environment.

Citizenship (social)

Citizenship is about individuals acting for the well-being of their community.

Action orientation (social)

To have an action orientation means having the skills and motivation to address issues by taking action to create a more sustainable future.

Informed decision-making (cultural)

Informed decision-making means seeking knowledge and using it ethically to make decisions that contribute to a sustainable future.

Resilience and regeneration (cultural)

Resilience is our ability to adapt to changes brought about by sustainability problems and regeneration is our capacity to overcome these problems and find solutions for a more sustainable world.

Consumerism (economic)

In this context, consumerism refers to knowledge, attitudes, and values that lead to the sustainable use of resources and production of waste within sustainable limits, as well as recognising the ethics of consumerism.

Enterprise and entrepreneurship (economic)

Sustainable enterprise and entrepreneurship encourages innovation and creativity, prevention, mitigation or remediation of sustainability issues in ways that lead to solutions for a sustainable future.

Return to previous page

Pedagogy for education for sustainability

Pedagogy is the ‘how’ of teaching. Together with content knowledge, it forms the core of our body of professional knowledge.

This section looks at approaches that are known to work with diverse learners and how teachers can know that their teaching is working.

Teacher actions promoting student learning

Effective teachers use a range of approaches to support student learning.

The New Zealand Curriculum offers generic information about effective pedagogy and describes a process for 'teaching as inquiry'. This cyclical process provides a framework that can help teachers to plan strategically and respond to the effects of their teaching, i.e. to think about how you're teaching and whether it's working. For example, is your teaching teacher directed or student directed, is it whole class, group work or individual work, is it text centred, discussion based or resource based? Is it developing action competence in students?

How are you monitoring student engagement? How do you get feedback from your students? Do you informally conference with them? Do you conduct class surveys – online or paper based?

- An inquiry process for teaching
- Four mechanisms that facilitate learning in the social sciences
- Approaches that encourage action competence
- Creating an inclusive learning environment
- Modelling what we value
- Developing the key competencies in EfS

Assessment in EfS

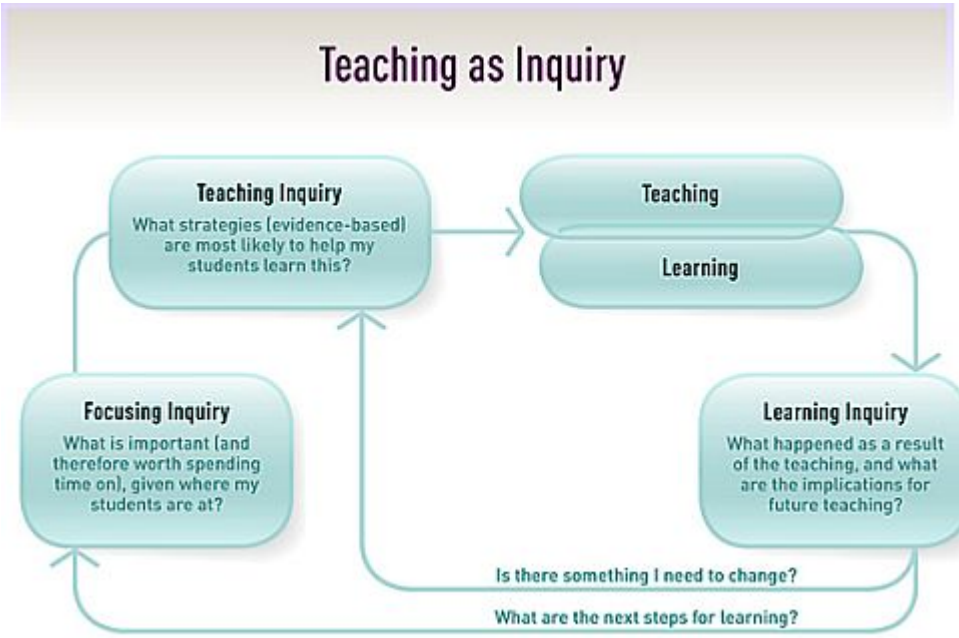
Good assessment practice, including summative as well as diagnostic and formative assessment, is part of good teaching.

- Assessing student learning in EfS
- EfS and national qualifications
- Readings and resource materials on assessment

An inquiry process for teaching

The New Zealand Curriculum (page 35) suggests that, to be effective, we need to consistently ask ourselves three questions:

- What is it important for me to be teaching now (focusing inquiry)?
- What strategies are most likely to help my students learn this (teaching inquiry)?
- What worked, and for whom, and what are the implications for my teaching (learning inquiry)?



Teaching as inquiry diagram from NZC.

The first question requires us to know our students; the second, to have (or acquire) the appropriate content knowledge and pedagogical content knowledge; the third, to assess what learning has gone on and in whose mind. The answer to this third question will have implications for our teaching – and possibly, our own learning. We may find we need to look for different strategies or even a completely different approach.

The curriculum offers a brief summary of pedagogical approaches that are applicable to all teaching. For a more comprehensive guide, with a specific focus on the social sciences, see Effective Pedagogy in Social Sciences/Tikanga ā Iwi Best Evidence Synthesis Iteration [BES]. This synthesis identifies four ‘mechanisms’ that are at the heart of effective social sciences teaching and learning.

Education for sustainability places strong emphasis on supporting students to develop action competence. This emphasis is strongly embedded in the learning objectives and requires teachers to adopt a holistic approach to teaching and learning.

Efs in the curriculum: taking action (EfS community, TKI website)

Four mechanisms that facilitate learning in the social sciences

Return to previous page

Four mechanisms that facilitate learning in the social sciences

The Effective Pedagogy in Social Sciences/Tikanga ā Iwi Best Evidence Synthesis Iteration (BES) identifies four mechanisms that facilitate learning for diverse students in social sciences: connection, alignment, community, and interest. Each of these mechanisms provides a lens through which we can examine our current practice. Each is backed by evidence that we can use when deciding what to do next.

- Make connections to students' lives
- Align experiences to important outcomes
- Build and sustain a learning community
- Design experiences that interest students

Make connections to students' lives

This mechanism particularly involves:

- drawing on relevant content
- ensuring inclusive content.

Students' understanding of important ideas and processes is enhanced when the teacher:

- encourages them to use their own experiences as a point of comparison when learning about other people's experiences in different times, places, and cultures
- uses language that is inclusive of all learners and their experiences
- selects resources that make diversity visible and avoid biased and stereotypical representations.

The connections mechanism at work in EfS

Students are more likely to achieve in EfS when they see themselves and their culture positively reflected in the subject matter and learning contexts.

Integrating an understanding of cultural identity into learning contexts promotes ako, a teaching and learning relationship in which the educator also learns from the student. By acknowledging, respecting, and valuing who students are and where they come from, teachers are in a position to build on what their students bring with them to the learning setting. This is essential for developing action competence. Cultural identity takes in relationships between people and between people and the natural world. Every culture has perspectives on and insights into the environment that can broaden possibilities for a sustainable future.

For example, the year 1–13 Te Kura Kaupapa Māori o Te Rā whiti Roa used sustainability to structure a whole-school learning journey: No hea tatou? In the context of their local awa (river), the students explored their links to the land and to the community's whakapapa. They centred the learning on protecting their awa by locating sources of problems, initiating community interest and support, and growing and planting trees for riparian conservation.

Community support for the learners' achievements from such school–community partnerships reinforces the students' sense of the worth of their learning.

- Creating an inclusive learning environment

TOP

Align experiences to important outcomes

This mechanism particularly involves:

- identifying prior knowledge
- aligning activities and resources to intended outcomes
- providing opportunities to revisit concepts and learning processes
- attending to the learning of individual students.

Student understanding of important ideas and processes is enhanced when the teacher accesses relevant prior knowledge, using it to minimise duplication of what is already known, and address misunderstandings that could inhibit new learning. If important outcomes are to be achieved, activities and resources need to be aligned to them. Teachers optimise alignment when they make it transparent to their students, design learning opportunities that are sequenced in response to ongoing assessment, and provide opportunities to revisit important content and processes.

The alignment mechanism at work in EfS

It is central to EfS that students develop the competence to take action for a sustainable future – and that they know why they are taking action.

> Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has.
>
> Margaret Mead

The choices that people make when deciding on particular courses of action always come back to the key EfS concepts. For this reason, it is vital that students are given numerous opportunities to examine the key concepts in relation to each of the aspects of sustainability before deciding what action to take on a sustainability issue. Competence to act requires balancing thinking with acting.

Taking informed action could include raising awareness and influencing others' behaviours through speeches, letters, drama, artworks, articles, and other indirect forms of action.

It could also include direct actions taken to mitigate, remedy, or redesign systems for a more sustainable future, such as habitat restoration, systems for effective and efficient resource management, sustainable design, building and transportation, pest removal, and food production.

The use of real-life, integrated contexts, in which students are active participants, teaches them to examine what is currently happening with a view to thinking and acting for a more sustainable future.

Use a range of teaching actions and teaching models to help your students:

- develop knowledge and understanding of issues
- learn to think empathetically
- build their capacity to take action on issues and concerns of interest

- learn how to target their actions to resolve concerns and issues at the source.

Going on a beach cleanup organised by the teacher is an activity, not an action for sustainability. Identifying a source of litter at the beach, such as plastic shopping bags, and developing a solution that targets the cause (for example, planning a campaign to reduce the use of plastic bags at the supermarket or designing advertising to promote safe disposal of litter at a boat club) is an action for a sustainable future.

The experiential learning cycle, co-operative learning, problem-based learning, and inquiry-based learning are all useful approaches for EfS.

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Build and sustain a learning community

This mechanism particularly involves:

- establishing productive teacher–student relationships
- promoting dialogue
- sharing power with students.

Student understanding of important ideas and processes in the social sciences is enhanced when teachers:

- establish productive relationships with students
- explicitly develop their students' interaction skills
- put in place inclusive practices that acknowledge multiple abilities and contributions
- delegate to students authority to make decisions about their learning
- design tasks and organise experiences that require student–student dialogue and interaction.

The community mechanism at work in EfS

The EfS classroom environment should enable debate and the expression of diverse views. Students need to feel that it is safe to propose and critique ideas for action. A supportive environment is also important when students are exploring how to identify and assign roles and act coherently as a group.

A supportive learning environment will develop when you:

- model and expect respectful relationships between individuals
- invite and value student contribution
- encourage the students to establish protocols for classroom discussion and debate
- challenge wide-ranging curiosity and inquiry across the learning areas, from different cultural perspectives, in local, national, or global contexts, and embracing diverse viewpoints.

Ka Hikitia – Managing for Success: The Māori Education Strategy 2008–2012 (Ministry of Education, 2008) suggested that involving students in decision making about their learning invites their commitment to the learning.

Learn more about Ka Hikitia in the updated Māori Education Strategy: Ka Hikitia – Accelerating

Success 2013–2017.

TOP

Design experiences that interest students

This mechanism particularly involves:

- meeting diverse motivational needs
- maximising student interest
- using a variety of activities.

Student understanding of important ideas and processes is enhanced when the teacher:

- makes learning as memorable as possible by deliberately designing learning experiences that are sensitive to students' differing interests, motivations, and responses
- provides a variety of experiences that become memorable anchors for learning and subsequent recall
- helps students draw the learning from these experiences.

The interest mechanism at work in EfS

EfS demands a holistic approach to teaching and learning. This has long been characterised as "education about, in, and for the environment".

This approach provides for a diversity of student learning styles and emphasises learning experiences that students will reflect on – two important factors in the development of action competence.

Rather than be dogmatic, EfS seeks to empower students to address issues that concern them and, in this way, to engage with their own futures. The visioning aspect of action competence requires students to consider alternatives to current thinking and acting, and to consider what kind of future they would like.

The "about, in, and for approach" emphasises inquiry, experiential, and co-operative pedagogies. For useful examples, see learning experiences (EfS community, TKI website).

The focus on action in EfS stimulates student participation and contribution and helps them to see that they can make a difference. Teachers support students to design manageable and achievable actions for sustainability.

Return to previous page

Approaches that encourage action competence

EfS is about engaging students with the world they live in and developing the ability to take action for a sustainable future. This means that teaching needs to develop action competence and the key competencies. The four approaches described here have been developed in different contexts, but they have direct applicability for teaching and learning in EfS.

Experiential learning

The Curriculum in Action materials online include detailed information about the experiential learning cycle, including a diagram that depicts the cycle's teaching and learning process.

- Diagram (Curriculum in action website)

This information was developed for teachers of health and physical education, but the approach is effective for teaching and learning in many school subjects, including EfS.

For example, have students reflect on the experience of a beach cleanup and respond to questions such as, 'What did I find?' 'Was I surprised?' 'Will this waste be back on the beach next week?' 'Where has it come from?' 'What changes are needed to reduce the waste on the beach?' Reflecting on an authentic learning experience helps students to build the knowledge that enables them to take focused action.

The UNESCO site Teaching and Learning for a Sustainable Future promotes the value of experiential learning in EfS.

Co-operative learning

Co-operative learning is an interactive or collaborative approach. The teacher guides or facilitates the learning to develop a sense of collective responsibility for the well-being of the group, the wider community, and the environment. Learning that explicitly aims to benefit all can energise and inform actions for a sustainable future.

For example, as part of a beach cleanup, support your students in working co-operatively. Discuss how working as a co-ordinated unit can have a greater impact than a bunch of individuals acting alone. Ask the students to think about their individual skills and preferences as they plan how to reduce marine waste in future. How do their collective skills match up with the actions they have identified? Who is most confident about approaching local businesses? Who would like to draft up letters to local newspapers? Are there art or design or photography students who could spearhead designing posters or fliers?

Problem-based learning

In problem-based learning, students assume primary responsibility for researching a problem. They can have a part in deciding on the problem to be researched and connecting the learning to their own interests.

For example, as they reflect on the results of a beach cleanup, have students choose an issue (such as waste disposal) that most interests them. Ask them to generate a plan to solve the

problem or improve the situation, such as designing an awareness campaign targeted at commercial fishing operators or developing biodegradable packaging.

The teaching and learning strategies described on UNESCO site Teaching and Learning for a Sustainable Future include future problem solving and community problem solving.

Inquiry-based learning

Inquiry-based learning involves the students in asking questions, gathering information and ideas, examining relevant issues (big ideas), and making systematic attempts to answer the questions they have identified. The questions and possible answers may lead into possible actions.

For example, the students could generate focus questions based on the data about the waste they collected during a beach cleanup and relating to the key concept of interdependence, in this case, how society's decisions and actions impact on the marine environment.

These focus questions and possible answers could flow on to actions such as lobbying local takeaway outlets to reduce packaging or designing an awareness campaign to save an endangered animal (the Maui's dolphin) or plant (pingao or pikao).

You can read more about inquiry-based learning on the UNESCO site Teaching and Learning for a Sustainable Future.

Also useful is the Building Conceptual Understandings in the Social Sciences (BCUSS) book Approaches to Social Inquiry (Ministry of Education, 2008). See the Social Sciences Online homepage for a PDF of this book.

Return to previous page

Creating an inclusive learning environment

Students are more likely to achieve in education for sustainability when they see their concerns and ideas taken seriously and their cultures valued in subject content and learning contexts.

By recognising that students have a cultural identity and inviting them to share their cultural knowledge in learning contexts, teachers promote ako, a teaching–learning relationship in which the teacher also learns from the student.

For the teacher, ako involves acknowledging, respecting, and valuing who students are and where they come from and, through deliberate and reflective practice, building on what they bring with them to the learning setting. People of all cultures have skills, knowledge, and qualities that can be built on.

Principles of a kaupapa Māori pedagogy

New Zealand's foundations are bicultural, so tikanga Māori should be at the centre of learning and all teaching should be informed by the kaupapa Māori principles identified by Russell Bishop and Ted Glynn [1]

Tino rangitiratanga – the right to determine one's own destiny. Parents and children are involved in decision-making processes.

Taonga tuku iho – the treasures from the ancestors, providing a set of principles by which to live our lives.

Ako – a mutual teaching and learning relationship in which the educator is also learning from the student.

Kia piki ake i ngā raruraru o te kāinga – reaches into Māori homes and brings parents and families into the activities of the school.

Whānau – the development of connections with the community to support learning.

Kaupapa – acknowledging and valuing the language and culture in the classroom and chosen contexts.

Read more about Te Kotahitanga

Read more about the Effective Teaching Profile

Some suggested contexts and approaches

- Visiting a marae to learn from kaumatua about Māori views of land ownership/kaitiakitanga;
- Field trips to sites that are of special significance to Māori;
- Collaborating with a local marae on a conservation or recycling project;
- Case study of a Pacific island (for example, Tuvalu) that is threatened by rising sea levels or global warming.
- Case studies of lost or endangered species of particular significance to Māori;
- Inviting individual (or groups of) students to chose a context that has particular cultural

significance for them;
- Inviting kaumatua to participate in a hui on a local or topical issue such as mining on conservation estate or declining populations of īnanga or kai moana;
- Case study of a Māori-owned eco-tourism or cultural tourism venture;
- Case study of pollution (or loss) as it affects a part of the world from which one or more of your students come. For example ocean plastic (Pacific Islands), mining effluents (Papua New Guinea or Africa), or pesticides (India or Bangladesh).
- Meetings with family and whanau to outline programmes of work and discuss ways in which they might support students in their learning;
- Upskilling teachers in terms of pronunciation and familiarity with the concepts that underlie Māoritanga;
- Case study of an economic or cultural initiative for sustainability in a part of the world from which one of more of your students come.

Footnotes

1. Culture Counts: Changing Power Relations in Education (1999). The Dunmore Press, Palmerston North.

Return to previous page

Modelling what we value

Education for sustainability is not values free. Core EfS values are closely related to the values found in the curriculum. Students expect to find congruence between the values their teacher promotes and the way that teacher teaches.

Teachers of sustainability teach for values (in other words, that values are important and influence our behaviour) and about values (the values that underpin sustainability).

Importantly, because EfS requires students to examine their own values and those of others, teachers need to be respectful of those values. By modelling respect, teachers demonstrate an integrity that gives students the confidence to be honest.

For examples of how the values of the New Zealand curriculum are fundamental to EfS and EfS teaching, see EfS and the values of the New Zealand curriculum.

Return to previous page

Developing key competencies in EfS

Our sustainable future depends on being able to think critically, participate, act, reflect, and connect. Developing the key competencies is part and parcel of EfS. EfS promotes development of the key competencies through learning activities that engage, encourage, challenge, and motivate students and teacher actions that foster student inquiry, discussion, understanding, active participation, and reflection.

There are generally no right answers in the process of inquiry and discussion, but there must be opportunities for exploring new understandings and insights about how we live in relationship to one another and all living things on this planet, and how these opportunities can lead to positive change and actions.

EfS equips young people to identify and think critically about sustainability issues and the choices necessary to secure a decent and humane future. Our future depends on people understanding the web of life and understanding the need to be responsible citizens of a biotic community.

Thinking

Teachers model active curiosity about the world. They encourage students to reflect on ideas, experiences, and information and to critique underlying assumptions about sustainability issues.

Well-designed learning activities help students become aware of:

- their own ways of thinking
- their approaches to and strategies for problem solving and appreciative inquiry
- how (and why) other people think the way they do
- their own perspectives and motivations.

These learning experiences can help students to draw on others' strengths in active group work to find collaborative solutions and take actions.

Understanding the consequences of our ways of thinking and acting is a necessary constraint on creative thinking. Creative thinking, using multiple perspectives and knowledge systems, leads to innovative ideas for a sustainable future.

Students develop curiosity about sustainability issues. This spurs them to research to create knowledge and to develop decision-making skills to respond to new opportunities.

Students could:

- investigate consumer pressures and relate them to their own actions
- use information about climate change, examine the implications for the school environment, identify key stakeholder groups and barriers and enablers to achieving change, and develop a strategy to present to their school board
- identify an issue relating to sustainability (for example, energy use) and investigate alternatives or solutions to be used in their schools or homes.

Using language, symbols, and texts

EfS requires students to interpret how implicit and explicit messages are communicated to individuals and society and to understand how this knowledge can be used to challenge and communicate positive change in a range of communicative modes.

Students begin to understand sustainability from a variety of perspectives by recognising and using a range of languages, symbols, and texts to explore ideas and issues in relation to different target groups.

Students could:

- investigate the language of consumerism in advertising (‘upsizing’, ‘buy one get one free’, and so on)
- investigate shop designs and layouts
- analyse slogans and communications strategies used by social marketers, protest movements, or lobby groups and explore how these use knowledge about different target groups
- examine media clips and films about sustainability issues for the messages they contain.

TOP

Managing self

Taking action for a sustainable future is central to EfS. Only by learning to reflect on their own values, attitudes, and behaviours are students in a position to understand what drives others, and so take effective action. Students need to have opportunities to set goals, manage timelines, negotiate with others, and respond appropriately in the face of difficulties.

Students need support as they explore what an individual can do to influence and bring about small- and large-scale change. Also, they need to examine the negative impacts anonymity can have on individual behaviour. They need to realise that they are part of an ecological system and that they have a responsibility for that system. They also need to recognise and understand their own strengths and weaknesses and take these into account when making plans.

Students could:

- understand that their use of resources has local and global impacts and implications
- develop and carry out an action plan, for example, changing a behaviour to make their way of life at home more sustainable
- survey other students’ attitudes to making change, consider the responses, and develop possible actions
- organise a guest speaker to motivate and inspire other students and teachers to take part in action on waste.

Relating to others

Many EfS learning activities require students to collaborate with others, providing opportunities for them to develop their abilities to listen and hear, recognise and appreciate different points of view, negotiate, and share ideas.

Activities also require students to engage with complex issues where they examine processes,

diverse perspectives, and underlying assumptions. These activities may involve exploring traditional cultural and/or religious practices that embrace or challenge notions of sustainability. Students may find themselves relating to or empathising with people whom they may never meet.

Students could:

- allocate roles in an action task to achieve certain collective goals
- invite experts to class to discuss an environmental or sustainability issue from a range of different perspectives to find a compromise that could work for all stakeholders
- build a vision map of their school
- plan a strategy for a business, integrating sustainability into their practices.

Participating and contributing

EfS can be context situated and authentic on all levels from local to global.

Learning experiences aim to engage students in real issues that affect them now and may continue to do so in the future.

Learning opportunities in both authentic and simulated contexts allow students to apply and practise their new learning.

By working with others on issues relevant to their communities, students see that they have a role to play in influencing change and that they can contribute to problem solving and decision making. Engaging with others on sustainability issues helps them understand the meaning of interdependence and their responsibilities to others now and in the future.

Students could:

- work in partnership with a marae committee to improve their waste system
- understand the importance of forests and initiate a planting event at their own school
- join or organise a school envirogroup or group of eco warriors to raise awareness of sustainability issues in their own school.

Developing the key competencies in EfS, years 1–13

A table showing how the competencies can be developed through experiences in education for sustainability in early childhood and years 1–13 through to tertiary education is provided at

Development of the Key Competencies Through Experiences in Education for Sustainability. (PDF, 43 KB)

Return to previous page

Assessing student learning in EfS

Assessment is bigger than NCEA. It is the means (provides the evidence) by which we are able to judge how effective our teaching is, and for whom. And it is the means by which students can measure their progress.

Diagnostic and formative assessment

Effective teachers use diagnostic and formative assessment:

- to identify different students' strengths and needs
- to provide detailed and thorough measurement of students' progress
- to identify the impacts of their teaching and the implications for future teaching.

EfS focuses on how students learn, as well as what they learn. How can you show the process by which their learning develops? What is the evidence of this process? What has happened for the student? What are the wider outcomes? Has something been protected in the environment, an environment enhanced, or a system developed or changed?

Evidence for a rounded EfS assessment may include the student's plan, their journal or online log, evidence (for example, photographs) that they have carried out their planned actions, and their written evaluations of their work in relation to a sustainable future.

Recognising action competence: an example

Assessment needs to capture and contribute to building action competence.

For example, at Auckland Girls' Grammar School, students keep online journals (similar to a blog) recording how their work is going, indicating barriers, things that are going well, and so on. The journals are accessible from outside school.

The teacher can see each student's feedback, but the students see only what they have posted. The teacher responds with feedback and suggestions of what to do next.

One group that wanted to promote sustainability needed to talk to people at school and described in their journals their attempts to do this, while another group had to change plans suddenly. The teacher used journal feedback to offer alternatives to both.

The journal provides dated evidence that the students have been working at or outside the school. It is particularly useful for groups or for students who prefer to work alone.

Involve students in their own assessment

Knowing what is expected of them strengthens the ability of EfS students to judge when they have got there and contributes to developing their action competence.

Formative assessment in a variety of contexts should be based on shared learning intentions and explicit success criteria developed through quality discourse and learning conversations and reinforced by focused feedback.

Self and peer assessment exercises, opportunities for reflection together with attention to the processes of reflection, and journals or portfolios are all useful tools to help students benefit from assessment information.

Students in pairs or small groups could grade or annotate exemplar scripts then compare their evaluations with the actual rankings in class discussion.
Suggest that, in addition to teacher assessment and self-evaluation, students may also find it useful to seek feedback from other people (extended family, people in the community).

See also the section approaches that encourage action competence

Return to previous page

EfS and national qualifications

This section lists the available EfS achievement standards and several considerations for their use.

NCEA achievement standards

EfS achievement standards were reviewed in 2015. They are designed for use in senior secondary learning programmes. Most of the standards can be used to assess learning in a local context in cross-curricular or integrated courses.

Assessment specifications, resources and clarification documents are available on the NZQA website.

Level 2

- AS90810 Education for sustainability 2.1 Undertake a personal action, with reflection, that contributes to a sustainable future; Internal, 6 credits.
- AS90811 Education for sustainability 2.2 Explain how human activity in a biophysical environment has consequences for a sustainable future; Internal, 4 credits.
- AS90813 Education for sustainability 2.3 Demonstrate understanding of how different personal values have implications for a sustainable future; Internal, 3 credits.
- AS90814 Education for sustainability 2.6 Demonstrate understanding of aspects of sustainability in different contexts; External, 4 credits.
- AS91733 Education for sustainability 2.4 Demonstrate understanding of initiatives that contribute to a sustainable future; External, 4 credits.
- AS91734 Education for sustainability 2.5 Develop a collaborative response that promotes a sustainable future, in relation to a current issue; Internal, 4 credits.

Level 3

- AS90828 Education for sustainability 3.1 Evaluate a personal action that contributes towards a sustainable future; Internal, 6 credits.
- AS90831 Education for sustainability 3.4 Analyse the impact that policies have on a sustainable future; External, 5 credits.
- AS90832 Education for sustainability 3.5 Develop a strategy for an organisation that will contribute to a sustainable future; Internal, 5 credits.
- AS91735 Education for sustainability 3.2 Evaluate measures that may be taken to sustain and/or improve a biophysical environment; Internal, 4 credits.
- AS91736 Education for sustainability 3.3 Analyse how different worldviews, and the values and practices associated with them, impact on sustainability; External, 4 credits.

TOP

Assessment resources

External assessment

Sample external level 2 assessments are available here:

- NZQA: Sample external assessments – Level 2

Check the level 3 report structure for AS90831 and AS91736 from this page:

- NZQA: Education For Sustainability subject resources

For more information about the report's content, presentation and format for AS90831 and AS91736 submission:

- NZQA: AS90831 and AS91736 Assessment specifications

Internal assessment

- Level 2 Education for sustainability assessment resources
- Level 3 Education for sustainability assessment resources

TOP

EfS and university entrance

University Entrance (UE) is the minimum requirement to go to a New Zealand university.

There was a review of university entrance in 2010 which led to changes that were implemented in March 2014. See the most current information on the NZQA website.

EFS achievement standards will be on the list of NCEA approved subjects for entrance to university in 2016.

Check this page for the approved EFS standards:

- Literacy requirements for university entrance

Schools need to be aware of university entrance requirements and the general admission requirements of New Zealand universities when setting up new learning programmes and advising students about their pathways.

If planning cross curricula programmes, teachers need to be aware of the requirements of the number of credits a student requires in a subject as the minimum requirement to go to a New Zealand university.

Return to previous page

Readings and resource materials on assessment

Information about effective pedagogy, including the teaching as inquiry process, can be found in The New Zealand Curriculum (pp. 34–36).

Specific approaches or mechanisms for teaching the social sciences are described on pages 54–55 of Effective Pedagogy in Social Sciences/Tikanga ā Iwi: Best Evidence Synthesis Iteration [BES] (Ministry of Education, 2009).

Effective pedagogy in EfS is discussed on the Education for Sustainability website.

The wider social dimensions of EfS are discussed in the New Zealand Parliamentary Commissioner for the Environment's report See Change.

See the learning programme design section of this guide for suggestions on how to plan EfS programmes.

See The New Zealand Curriculum (pp. 39–41) for a discussion of assessment in relation to school curriculum design and review.

See the resources section of this guide for links to online assessment resources.

Return to previous page

Learning objectives

The New Zealand Curriculum does not state specific achievement objectives for education for sustainability. Learning objectives have been developed to indicate the progression in learning that teachers might expect to see across curriculum levels 7 and 8. These objectives are structured in three inter-related strands:

- Knowledge and understanding
- Attitudes and values
- Actions

It is important that students see and make sense of the many connections within and across these strands and those in other subjects such as geography, health, and biology.

Progression in EfS

As they move from level 7 to 8, students develop their action competence and their critical thinking. They move from describing how people affect the environment to planning and participating in positive action, through to evaluating action and its impacts, both short-term and long-term. At the same time, the focus moves from guided action to informed, independent action.

For more on action competence, see Approaches that encourage action competence.

Indicators

Indicators are examples of the behaviours and capabilities that a teacher might expect to observe in a student who is achieving at the appropriate level. Teachers may wish to add further examples of their own.

Context elaborations

Context elaborations are possible contexts for learning, with a suggestion of how they might be used with the learning objective.

The listed context elaborations are examples only. Teachers can select and use entirely different contexts in response to local situations, community relevance, and students' interests and needs.

Assessment for qualifications

Possible achievement standards are suggested for each learning objective.

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

The flexibility of the qualifications system allows schools to keep assessment to levels that are manageable and reasonable for both students and teachers. Not all EfS learning objectives need to be formally assessed.

EfS learning objectives

The following learning objectives indicate the progression in learning by strand that teachers might expect to see across curriculum levels 7 and 8. Each learning objective includes a set of indicators, with examples of possible concept links, and guidance about possible context elaborations and relevant achievement standards.

Level 7 learning objectives

Students will gain knowledge, skills, and experience to:

Knowledge and understanding

- Investigate how to enhance and maintain biophysical systems and improve biodiversity.
- Investigate the aspects of sustainability in different contexts.

Attitudes and values

- Examine the values and behaviours that will contribute to a sustainable future.

Actions

- Plan, implement, and evaluate personal action for a sustainable future.

Level 8 learning objectives

Students will gain knowledge, skills, and experience to:

Knowledge and understanding

- Evaluate social, economic, and technological measures that could be taken to sustain natural resources and improve biodiversity now and for the future.
- Analyse the impact of strategies and initiatives for a sustainable future.

Attitudes and values

- Analyse the values of different groups of people, how these values are expressed in various practices, and the present and future consequences for sustainability.

Actions

- Analyse actions necessary for sustainability and plan, implement, and critically evaluate personal action for a sustainable future.

Learning objective 7.1

Students will gain knowledge, skills, and experience to:

- investigate how to enhance and maintain biophysical systems and improve biodiversity.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Finite resources (economic)
- Ecosystem (environmental)
- Guardianship/kaitiakitanga (environmental)
- Resilience and regeneration (social)
- Respect for all life (environmental)

Indicators of success

- Demonstrates understanding of the research process, evidenced by the submitted report or other method of presentation of findings.
- Demonstrates understanding of the concepts kaitiakitanga and manaakitanga, evidenced by reference to this concept throughout the research process.
- Demonstrates understanding of how humans have impacted on biophysical environments over time.

Possible context elaborations

- Riparian planting along water-ways, for example, Waitaha Wai: Waterways of Christchurch – Tributaries of the Avon/Ōtākaro: Two case studies (page 55).
- Domestic heating policies and/or legislation – Christchurch case study.
- Native planting schemes, for example, Restoration case studies.
- Modern stormwater systems
- 5 gyres project (plastic pollution) to enhance and maintain biophysical systems and improve biodiversity.
- Modern landfill practices to enhance and maintain biophysical systems and improve biodiversity.
- Impact of local activities such as viticulture, agriculture, forestry, aquaculture on a biophysical environment.

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

Learning objective 7.1 can be assessed using the following achievement standard:

- AS90811 Education for sustainability 2.2 Explain how human activity in a biophysical

environment has consequences for a sustainable future; Internal, 4 credits.

Return to previous page

Learning objective 7.2

Students will gain knowledge, skills, and experience to:

- investigate the aspects of sustainability in different contexts.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Resilience and regeneration (social)
- Guardianship / kaitiakitanga (environmental)
- Intergenerational equity (social)
- Finite resources (economic)

Indicators of success

- Demonstrates how the aspects of sustainability apply across different contexts, using a range of case studies.
- Explains the positive and negative interrelationships between the aspects of sustainability within different contexts.
- Evaluates with supporting evidence the wider implications of the interrelationships between the aspects of sustainability for a sustainable future.

Possible context elaborations

- The aspects of sustainability applied to threatened environments, for example, the Amazon.
- The aspects of sustainability applied to air pollution in a mega-city, for example Mexico; or a smaller New Zealand city such as Christchurch.
- The aspects of sustainability applied to the establishment of community gardens in an urban area of New Zealand.
- The aspects of sustainability applied to affordable housing in Auckland.
- The aspects of sustainability applied to zombie towns.
- The interactions of aspects of sustainability applied to a global business, for example, palm oil production.
- The aspects of sustainability applied to a festival, for example, Polyfest.
- Comparison of local initiatives to enhance biodiversity, for example, in Marlborough:
    - Kaipupu Point Mainland Island
    - The Tui to Town project
    - Te Whanau Hou project – the Grovetown Lagoon Project

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

Learning objective 7.2 can be assessed using the following achievement standards:

- AS90814 Education for sustainability 2.6 Demonstrate understanding of aspects of sustainability in different contexts; External, 4 credits.
- AS91733 Education for sustainability 2.4 Demonstrate understanding of initiatives that contribute to a sustainable future; External, 4 credits.
- AS91734 Education for sustainability 2.5 Develop a collaborative response that promotes a sustainable future, in relation to a current issue; Internal, 4 credits.

Return to previous page

Learning objective 7.3

Students will gain knowledge, skills, and experience to:

- examine the values and behaviours that will contribute to a sustainable future.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Social justice, (social)
- Resilience and regeneration (social)
- Intergenerational equity (social)
- Cultural diversity (social)
- Guardianship/kaitiakitanga (environmental)

Indicators of success

- Indicates understanding of how different personal values and associated behaviours have implications for a sustainable future.
- Explains how different values and associated behaviours have implications for the management of the environment.
- Evaluates how and why economic practices can change to become more sustainable.
- Reflects on own values in relation to a sustainable future.

Possible context elaborations

- The cultural practices and values of a local marae and how these contribute to a sustainable future.
- The values and practices that support the use of alternative energy such as wind farms and the contribution to a sustainable future for New Zealand.
- Investigate a local industry, for example, aquaculture, and how the values and practices of various stakeholders contribute to or hinder a sustainable future.
- The values and associated practices of one's own extended family with regard to the recycling of household waste.

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

Learning objective 7.3 can be assessed using the following achievement standards:

- AS90813 Education for sustainability 2.3 Demonstrate understanding of how different personal values have implications for a sustainable future; Internal, 3 credits.

Return to previous page

Learning objective 7.4

Students will gain knowledge, skills, and experience to:

- plan, implement, and evaluate personal action for a sustainable future.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Resilience and regeneration (social)
- Action orientation (social)
- Informed decision-making (social)
- Enterprise and entrepreneurship (economic)
- Ecosystem (environmental)

Indicators of success

- Demonstrates action competence with student focus progressing from guided action to independent action.
- Evaluates how and why the implementation of the personal action plan contributed to a sustainable future.
- Reflects on whether the action changed one's own attitudes and behaviours in relation to the sustainability issue.
- Draws conclusions around the strengths, weaknesses, opportunities, threats and observed trends in relation to the sustainability issue.

Possible context elaborations

The organisation of:

- a sustainability conference for secondary school students, with scope for reflection
- a beach or river clean-up, with scope for reflection
- a car-free day for a school, with scope for reflection
- a " clothes swap" for a school, with scope for reflection
- a " switch-it-off" energy-saving initiative or campaign, with scope for reflection.

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

Learning objective 7.4 can be assessed using the following achievement standards:

- AS90810 Education for sustainability 2.1 Undertake a personal action, with reflection, that contributes to a sustainable future; Internal, 6 credits.

Return to previous page

Learning objective 8.1

Students will gain knowledge, skills, and experience to:

- evaluate social, economic, and technological measures that could be taken to sustain natural resources and improve biodiversity now and for the future.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Finite resources (economic)
- Ecosystem (environmental)
- Guardianship/kaitiakitanga (environmental)
- Enterprise and entrepreneurship (economic)
- Community (social)

Indicators of success

- Identifies a range of social, economic, and technological measures that sustain and/or have the potential to sustain natural resources and improve biodiversity now and for the future.
- Explains how a range of social, economic, and technological measures can sustain natural resources and improve biodiversity now and for the future.
- Analyses the effectiveness of the measures with reference to the aspects of sustainability.
- Discusses the wider implications of the measures that could be taken to sustain natural resources and improve biodiversity now and for the future.

Possible context elaborations

- Waste management on a ski field – measures that could be taken to reduce the impact of waste.
- Management of organic waste in a school environment – measures that could be taken to reduce the impact of organic waste.
- Visitor management in regional parks – measures that could be taken to manage the impact of people on the natural environment.
- Management of freedom campers – measures that could be taken to manage their impact on the natural environment.
- Potable water conservation – measures that could be taken to reduce the consumption of potable water in an urban environment.
- Case studies of innovative primary production systems that are demonstrating sustainable practices, for example, dairy farming, viticulture, aquaculture, forestry (an example: Marlborough District Council Environmental Awards).

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by

going to the NZQA website.

Learning objective 8.1 can be assessed using the following achievement standard:

- AS91735 Education for sustainability 3.2 Evaluate measures that may be taken to sustain and/or improve a biophysical environment; Internal, 4 credits.

Return to previous page

Learning objective 8.2

Students will gain knowledge, skills, and experience to:

- analyse the impact of strategies and initiatives for a sustainable future.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Resilience and regeneration (social)
- Community (social)
- Finite resources (economic)
- Enterprise and entrepreneurship (economic)
- Intergenerational equity (social)
- Kaitiakitanga (environmental)

Indicators of success

- Identifies policies that have been put into practice and have achieved sustainable/unsustainable outcomes.
- Draws conclusions based on evidence and relevant case studies about the impact of policies in relation to environmental, social, cultural, and economic sustainability.
- Identifies criteria with which to analyse the success of strategies and policies.
- Analyses the success of the implementation based on whether it meets the original intent of the strategies and initiatives.
- Analyses the extent to which the policies contribute to a sustainable future.
- Develops an appropriate strategy for an organisation that will contribute to a sustainable future.
- Draws conclusions to justify the likely effectiveness of the chosen strategy in contributing to a sustainable future.

Possible context elaborations

The impact of:

- environmental refugees on immigration policies – Australia
- regional policies for managing the effects of climate change – Canterbury
- potable water conservation strategies – Sweden
- waste management policies for communities – Kaikoura
- theft policies for local fuel stations
- bullying policies for local schools
- fresh water management policies on water quality
- fisheries management policies on sustainable fishing
- palm oil policies, for example, Auckland zoo.

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

Learning objective 8.2 can be assessed using the following achievement standards:

- AS90831 Education for sustainability 3.4 Analyse the impact that policies have on a sustainable future; External, 5 credits.
- AS90832 Education for sustainability 3.5 Develop a strategy for an organisation that will contribute to a sustainable future; Internal, 5 credits.

Return to previous page

Learning objective 8.3

Students will gain knowledge, skills, and experience to:

- analyse the values of different groups of people, how these values are expressed in various practices, and the present and future consequences for sustainability.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Social justice (social)
- Intergenerational equity (social)
- Cultural diversity (social)
- Guardianship/kaitiakitanga (environmental)
- Community (social)

Indicators of success

- Identifies a range of worldviews and their associated values and practices.
- Explains the interrelationships between values, practices, and aspects of sustainability.
- Draws conclusions about the consequences for sustainability, both present and future, as a result of different worldviews.
- Analyses the complexities associated with different worldviews when considering the implications for present and future sustainability.

Possible context elaborations

- The cultural practices and values of Māori as an indigenous people compared to a Western scientific worldview.
- The cultural practices and values of Buddhism compared to a Capitalist worldview.
- The values and associated practices of the United States compared to China with regard to carbon emissions policies.
- The values and associated practices of New Zealanders compared to those of a Western European country, Netherlands, for example, with regard to cycling being the preferred means of transport.
- The values and associated practices of New Zealanders compared to those of a Western European country, Germany, for example, with regard to private car ownership.

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

Learning objective 8.3 can be assessed using the following achievement standard:

- AS91736 Education for sustainability 3.3 Analyse how different worldviews, and the values

and practices associated with them, impact on sustainability; External, 4 credits.

Return to previous page

Learning objective 8.4

Students will gain knowledge, skills, and experience to:

- analyse actions necessary for sustainability and plan, implement, and critically evaluate personal action for a sustainable future.

Possible concept links

- Environmental, social, cultural, and economic sustainability
- Resilience and regeneration (social)
- Action orientation (social)
- Informed decision-making (social)
- Enterprise and entrepreneurship (economic)
- Citizenship (social)
- Ecosystem (environmental)

Indicators of success

- Develops a personal action plan in relation to a sustainability issue.
- Implements the action plan, making and documenting changes where necessary.
- Analyses the interrelationships between the aspects of sustainability in relation to the sustainability issue that provoked the personal action.
- Establishes judgment criteria and analyses the effectiveness of the personal action in relation to a sustainable future.
- Considers how the personal action has impacted on own attitudes and behaviours.

Possible context elaborations

- The planning, development, implementation, and critical evaluation of an innovative waste management system for a school or business.
- The planning, development, implementation, and critical evaluation of a native planting scheme for a school or community area.
- The planning, development, implementation, and critical evaluation of a cycling rally to raise awareness of the numerous benefits of cycling.
- The planning, development, implementation, and critical evaluation of a shade audit for a school.
- The planning, development, production, and critical evaluation of a film disseminated to an audience designed to raise awareness of a major issue such as climate change.

Assessment for qualifications

At the time of publication of this teaching and learning guide, EfS achievement standards had recently been reviewed. Please ensure that you are using the correct version of the standards by going to the NZQA website.

Learning objective 8.4 can be assessed using the following achievement standard:

- AS90828 Education for sustainability 3.1 Evaluate a personal action that contributes towards a sustainable future; Internal, 6 credits.

Return to previous page

Connections

This section looks at how EfS fits the wider curriculum and how it can be an important and valuable part of a student's learning pathway.

> There is a limit to how much education you can sustain for no obvious reason … but if they are starting to develop a view that what I am doing will lead me to this area or that area, if they see the connection, it gives them a reason to continue to learn their English, to develop their maths, or whatever they need … that there is a purpose for it …
>
> (Stuart Middleton, Manukau Institute of Technology)

EfS as a collaborative enterprise

A survey of the achievement objectives in The New Zealand Curriculum will show that many of them relate to the themes and the learning around EfS. Most of these are in the social sciences, health and physical education, science, technology, and the arts. In other subjects, such as English and mathematics and statistics, EfS can provide relevant themes and contexts for parts of the learning programme.

EfS works well when taught collaboratively by more than one teacher and by drawing on more than one subject. While this can be challenging in a secondary school, even a modest collaboration can give teachers greater confidence when working with complex issues and can model the interdisciplinary nature of those issues.

Teaching and learning in EfS can be powerfully reinforced by a whole-school approach that brings together the school's learning programmes, the ways members of the school community work with one another, sustainable practices and policies in the school, and the way the school and its grounds are cared for.

Strong community partnerships support learning in EfS and also help students to understand that what they are learning and doing now makes an immediate contribution to a sustainable future.

> You can't teach people everything they need to know. The best you can do is position them where they can find what they need to know when they need to know it.
>
> Seymour Papert, mathematician, computer scientist, and educator

The learning programme design section of this guide discusses integrated approaches.

The pedagogy section of this guide makes numerous suggestions as to how EfS learning can be assessed using achievement standards from a variety of different subjects.

- EfS and the principles of The New Zealand Curriculum
- EfS and the values of The New Zealand Curriculum
- From primary to tertiary and beyond
- Green jobs for a green future

EfS and the principles of the New Zealand Curriculum

The examples below suggest how EfS can support the principles of the New Zealand Curriculum.

High expectations

Students gain a sense of success through planning and completing an action that brings about a change. For example, students collaborate in a community garden to support an initiative to supply a local foodbank.

Treaty of Waitangi

Students establish a relationship with their local iwi, focused on the whenua. For example, students initiate discussions and make plans to help their local marae become more sustainable.

Cultural diversity

Students examine a variety of worldviews in considering sustainability issues. For example, students examine cultural perspectives on harvesting seafood.

Inclusion

The different skills, attributes, and needs that students bring to collaborative projects are recognised, affirmed, and supported. For example, students present a formal submission to council with different roles assigned to team members as appropriate.

Learning to learn

Students are supported as they develop processes to reflect on their action experiences. For example, students use starter question cards in a circle discussion that help them to think deeply about their action experiences.

Community engagement

Students form relationships with a number of established communities (including families) or organisations beyond the classroom. For example, students work with the local Forest and Bird branch to build nesting boxes for penguins.

Coherence

Students work on action projects that incorporate achievement objectives from more than one learning area. For example, students undertake an inquiry project into a sustainability issue of their choice in one of the social science subjects and present a speech on the issue for English (Speaking, Writing, and Presenting).

Future focus

Students explore the links between the four future-focused issues. For example, students work in collaboration with a business or industry to develop a sustainability policy that takes into account elements of globalisation, enterprise, and citizenship.

Return to previous page

EfS and the values of the New Zealand Curriculum

EfS continually confronts students with values-related issues. Students are challenged to uncover the values that lead people to act in the ways they do and, at the same time, they are challenged to explore and test their own values. Below are examples of how learning in EfS can develop the values listed in the New Zealand Curriculum.

Excellence; hiranga

Students set realistic goals and persevere in addressing an issue in spite of barriers. For example, students are resilient and keep going (when faced with resistance) as they work on an action to mitigate wasteful practices in their school.

Innovation, inquiry, and curiosity; pokirehau, whakamatemate

Students consider various viewpoints, are open to differences, and use a variety of thinking tools when investigating an issue. For examples, students conduct a study on the spread of HIV in Africa and discuss the links with poverty, environmental degradation, and climate change.

Diversity; rereketanga

Students engage ethically with difference and recognise that we each view the world through lenses that are shaped by culture, language, and history. For example, students consider the values and debate the practices of shellfish gathering by Pākehā, Māori, and Asian communities.

Equity; tika/pono

Students develop an understanding of fairness and social justice by critically analysing relationships of language, power, social practices, identities, and inequalities. For example, students consider fair trade and the use of child labour by investigating the manufacture of T-shirts from growing the cotton to final purchase.

Community and participation; porihanga

Students develop an understanding of the common good through participating in community activities. For example, students participate in community planting events, such as restoration plantings during World Environment Day.

Ecological sustainability; kaitiakitanga

Students consider approaches to ecological sustainability and what caring for the environment may mean. For example, students are actively involved in developing an ecologically sustainable plan for their school grounds.

Integrity; ngākau/tapatahi

Students develop an understanding and appreciation of integrity in relation to our interactions with one another and with all living things. For example, students develop a fair and responsible means of addressing those who litter and set up practices to keep their school litter free.

Respect; manaaki/āwhi

Students develop a greater understanding of the importance of respect for all living things and for those yet to come. For example, students are respectful of people, property, and the environment and show this in the activities they are involved in around the school and local community.

See also modelling what we value

Return to previous page

From primary to tertiary and beyond

Students need to connect what they are learning in EfS with possible learning pathways. They also need to see how their learning in EfS is giving them skills for life and options for further education, as well as preparing them for possible careers.

Many primary school students are keenly aware of their environment, take part in environment-related actions, and are involved in making decisions about their environment.

These attitudes, skills, and experiences need to be built on during secondary education. At the very least, year 9 and 10 students need to be kept aware of the importance of the environment to their future lives and well-being.

In the senior secondary school, EfS can contribute to developing young adults with the skills to address sustainability issues, create entrepreneurial opportunities, and act for a sustainable future. EfS can also be a pathway to tertiary education and a range of careers.

Students need to be given good guidance about what subjects are required for tertiary courses that could interest them. The EfS teacher has a responsibility here, supported by the school's careers education programme and services.

Possible courses of study, including options for integrated learning, are described in more detail in the learning programme design section of this guide.

Return to previous page

Green jobs for a green future

Unlike the many short-term considerations that influence the workplace, the need for people who understand sustainability issues, and who have the skills and attitudes to contribute to solutions, is not going to go away any time soon.

Global trends suggest that government and, increasingly, private spending will prioritise green jobs, leading to a greener economy. The International Labour Organisation reports that in the European Community and the United States more jobs are becoming available in areas such as organic farming, sustainable forestry, renewable energy, water supply, retrofitting, resource recovery, and environmental tourism.

Increasingly, developers of major new buildings in New Zealand cities are asking their architects to design green buildings. Whether they are driven by personal values or demand for green office space makes little difference.

Workers will be needed in new green industries, in traditional green collar jobs (conservation, environmental management, sustainable urban planning and research), and in agriculture and horticulture, environmental law, medicine, engineering, design, architecture, and accounting.

An understanding of sustainability will be an advantage in any career, as well as enabling the individual to contribute to a sustainable future.

The Education for Sustainability website includes a downloadable poster on its Pathways in EfS page.

Training for a green career

Some examples of green careers and possible training:

Open space planner for a city council (parks planning in cities): Bachelor of Planning or Master of Planning, University of Auckland.

Sustainable transport co-ordinator for a council: BSc or BA majoring in environmental studies, Victoria University.

Fisheries officer: Bachelor of Applied Science (Biodiversity Management), Unitec.

Public health officer: Bachelor of Applied Science (Environmental Studies), AUT.

Park ranger: National Certificate in Conservation (Trainee Ranger), Nelson Marlborough Institute of Technology (one year).

Resource management adviser: Diploma in Environmental Management / Bachelor of Recreation Management, Bay of Plenty Polytechnic (two years) / Lincoln University.

Environmental lawyer: Bachelor of Law and Master of Law (Environmental), University of Auckland (four years for LLB and one year for MLB).

Return to previous page

Learning programme design

Education for Sustainability programmes need to be carefully planned if they are to achieve the desired outcomes. This section suggests how to go about this planning and provides examples of programmes.

Effective pedagogy

Any good programme depends on effective pedagogy. When planning, keep in mind the Environmental Education Guidelines and the four social science mechanisms: connection, alignment, community, and interest (see: Four mechanisms that facilitate learning in the social sciences).

Social science four mechanisms

Connection

Encourage students to use their own experiences as a point of comparison when learning about other people's experiences and worldviews in different times, places, and cultures. The contexts and resources should make diversity visible and avoid biased and stereotypical representations. Students need to feel that what they are learning connects with and values their experiences.

Alignment

Activities and resources need to be aligned so that students are able to develop understandings of the key concepts and all four aspects of sustainability: environmental, social (including governance), cultural, and economic. The aims of the programme should be made transparent to students. Learning opportunities should not be pre-programmed to the extent that they cannot be changed in response to assessment, and they should provide opportunity for students to revisit important content and processes. Assessment should focus on assessing valued learning, including action competence.

Community

Programmes should be designed to develop students' interaction skills and use practices that include different abilities and levels of contribution. Tasks and experiences that require student–student interaction are best. Wherever possible, students should be involved in making decisions about their own learning. Students need to be given the opportunity to identify possible roles for themselves, to think critically, and to participate in authentic actions for sustainability.

Interest

Programmes should deliberately offer learning experiences that are sensitive to students' differing interests, motivations, and responses and provide a variety of experiences that become anchors for learning and recall. Local contexts can engage students with the community as well as provide bridges to global issues.

TOP

Environmental Education Guidelines

- Guidelines for Environmental Education in New Zealand Schools

Environmental education involves the integration of three key dimensions:

- Education in the environment
- Education about the environment
- Education for the environment

A balanced environmental education programme addresses all three dimensions.

TOP

Questions to ask when planning your programme

- What will be my primary resources?
- What community expertise can I help my students access?
- What EOTC experiences can I plan for? What risk management requirements will I need to meet?
- How can I ensure students are able to explore sustainability contexts in detail and produce significant outcomes?
- Will my students be able to see connections between the different aspects of sustainability?
- How am I planning for reflection and feedback?
- How am I planning to revisit concepts and/or explore them in different contexts?
- If it is a cross curricula course, does the combination of assessments allow students to obtain University Entrance?
- Does the combination of assessments allow students to obtain course endorsement?
- What are the entry requirements for this course? Why?

TOP

Possible structures

EfS programmes can be structured in a variety of ways, for example, as linked courses over three full years, as one-year courses, or as short (modular or one-semester) courses. A programme should be flexible enough to allow for students to begin studying EfS at any year level.

EfS programmes can be structured in a variety of ways, for example:

- as a dedicated EfS programme over two years
- as a composite programme (that is, level 7 and 8 students in one class which could also

include multi-level study)
- as modular courses that may be semesterised
- as achievement standards integrated into another learning programme (for example, philosophy, agricultural science, geography or biology).

A programme should be flexible enough to allow for students to begin studying EfS at any year level.

Theme approach

Themed approaches could be adopted for the development of an EfS programme.

A themed approach could include application of the four aspects of sustainability to the biophysical environment model, whereby the focus of a programme could be selected from the atmosphere, hydrosphere, lithosphere and biosphere.

All eight learning objectives could be foregrounded in such a programme.

For example:

Level 7

- The atmosphere, global warming, air pollution
- The biosphere, loss of biodiversity, eco-congestion, increased risk of fire, endangered species, habitat adaptation

Level 8

- The hydrosphere, global sea-level rise, flooding
- The lithosphere, soil degradation, soil erosion, soil contamination, desertification

Alternatively, a themed approach could include application of the four aspects of sustainability to a range of current environmental issues. For example:

- Global climate change
- Threatened environments
- Loss of biodiversity
- Global water supply
- Ocean acidification
- Pollution
- Deforestation
- Environmental refugees
- Renewable energy

TOP

Cross-curricular approaches to programme design

Sustainability is about the interrelationship between people and the environment. Students are best able to explore this relationship if they are offered learning experiences that:

- link the four key aspects of sustainability (environmental, social, cultural, and economic)
- make use of global, national, and local contexts
- are relevant to the students' interests and concerns
- relate to the appropriate curriculum levels.

Ideally, teachers and students are able to work across learning areas. Teachers will need time to meet and plan together.

Possible models

Some ideas:

- Teachers from different learning areas plan EfS learning across the curriculum, then teach their sections of the plan within their specialist areas. EfS could provide a curriculum focus for a year group.
- Teachers from different learning areas, for example, from English, mathematics and statistics, science, and social studies, plan schemes of work around a common theme, with teachers and students making explicit connections between social and environmental aspects.
- Teachers from different learning areas develop a programme that can be taught using a team approach. Assessment opportunities from EfS and other subjects are offered, and students make choices based on their needs.

TOP

Examples of programmes

You may find these helpful. These programmes are just examples only.

- Developing an integrated EfS programme at your school (PDF 75 KB)
- Case study: An EfS project involving Kaikorai Valley College and neighbouring schools (PDF 84 KB)
- Theme: Application of the four aspects of sustainability to the biophysical environment model (two-year programme)
- Theme: Application of the four aspects of sustainability to the biophysical environment model (one-year composite programme)
- Marlborough Girls' College Education for Sustainability programmes (level 7 and 8)

TOP

Learning pathways

The principle of coherence (The New Zealand Curriculum, p. 9) states that:

> "The curriculum offers all students a broad education that makes links within and across learning areas, provides for coherent transitions, and opens up pathways to further learning."

Coherence means that students' programmes (within and across years) should collectively equate to more than the sum of their parts. Nothing should be a dead-end.

For this reason, it is important that teachers identify and emphasise the common threads of learning as well as the unique contribution of their particular subject. The key competencies suggest a means for this.

When designing EfS learning programmes, consider these questions:

- How might EfS fit within a student's total programme?
- How might learning from other senior subjects support their learning about sustainability? (See, for example, Accounting: Learning programme design – Cross-curricular approaches based on values.)
- How might EfS contribute to their lifelong learning? (Keep a diverse range of students in mind.)
- How can community resources help students plan for the future?
- Where might a year 12 or 13 student take their learning the following year?
- Even if a student does no further formal learning about sustainability, how might it nevertheless be an important part of their learning journey?

Teaching and learning will revolve around key competencies that will support students' ability to contribute to and expand their worlds.

Theme: Application of the four aspects of sustainability to the biophysical environment model

A two-year programme

	EfS Level 7 Year 1 – Atmosphere and Biosphere	EfS Level 8 Year 2 – Hydrosphere and Lithosphere
Term 1	LO 7.2 Students will gain knowledge, skills, and experience to investigate the aspects of sustainability in different contexts. Introduction to EfS aspects, key concepts, key principles, key terms and contexts. LO 7.3 Students will gain knowledge, skills, and experience to examine the values and behaviours that will contribute to a sustainable future. AS90813 Education for sustainability 2.3 Demonstrate understanding of how different personal values have implications for a sustainable future; Internal, 3 credits. The values and practices that support the use of alternative energy such as wind farms and the contribution to a sustainable future. Skills module: • Group work skills • Research skills • Report writing skills	Revisit EfS aspects, key concepts, key principles, key terms and contexts. LO 8.4 Students will gain knowledge, skills, and experience to analyse actions necessary for sustainability and plan, implement, and critically evaluate personal action for a sustainable future. AS90828 Education for sustainability 3.1 Evaluate a personal action that contributes towards a sustainable future; Internal, 6 credits. The production of a film disseminated to an audience designed to raise awareness of sea-level rise, one of the major effects of global climate change. Skills module: • Strategy development skills • Report writing skills • Investigation/selection of policies for AS90831 It is very important to refer to both current specifications and explanatory note 5 before planning for the teaching and relevant assessment of.
Term 2	LO 7.4 Students will gain knowledge, skills, and experience to plan, implement, and evaluate personal action for a sustainable future. AS90810 Education for sustainability 2.1 Undertake a personal action, with	LO 8.2 Students will gain knowledge, skills, and experience to analyse the impact of strategies and initiatives for a sustainable future. AS90832 Education for sustainability 3.5 Develop a strategy for an organisation that

	reflection, that contributes to a sustainable future; Internal, 6 credits. The organisation of a car-free day for a school, with scope for reflection. LO 7.1 Students will gain knowledge, skills, and experience to investigate how to enhance and maintain biophysical systems and improve biodiversity. AS90811 Education for sustainability 2.2 Explain how human activity in a biophysical environment has consequences for a sustainable future; Internal, 4 credits. Investigation of modern landfill practices and the consequences for a sustainable future.	will contribute to a sustainable future; Internal, 5 credits. The development of a strategy to raise awareness of potable water conservation in a drought-prone community or region; example, Canterbury. LO 8.1 Students will gain knowledge, skills, and experience to evaluate social, economic, and technological measures that could be taken to sustain natural resources and improve biodiversity now and for the future. AS91735 Education for sustainability 3.2 Evaluate measures that may be taken to sustain and/or improve a biophysical environment; Internal, 4 credits. Waste management on a ski field; measures that could be taken to reduce the impact of waste; example, Coronet Peak.
Term 3	Externals LO 7.2 Students will gain knowledge, skills, and experience to investigate the aspects of sustainability in different contexts. AS90814 Education for sustainability 2.6 Demonstrate understanding of aspects of sustainability in different contexts; External, 4 credits. All previous contexts provide relevant preparation for this resource based external achievement standard. An additional context that fits with the biosphere theme is the establishment of community gardens in New Zealand. AS91733 Education for sustainability 2.4 Demonstrate understanding of initiatives that contribute to a sustainable future; External, 4 credits. With this external achievement standard also being resource based, preparation	Externals LO 8.2 Students will gain knowledge, skills, and experience to analyse the impact of strategies and initiatives for a sustainable future. AS90831 Education for sustainability 3.4 Analyse the impact that policies have on a sustainable future; External, 5 credits. Two policies have been chosen and reviewed in detail in Term 1 to reduce the preparatory workload in Term 3 when developing/completing the written report for submission.

	could include investigation into a range of initiatives relating to the atmosphere and biosphere: • Native planting initiatives for communities • Riparian planting initiatives for the rural sector • Domestic heating and associated air pollution initiatives • Reduction of carbon emissions initiatives	
Term 4	Revision for externals and practice of exam technique skills.	Completion of externals.
	Total credits: 21	Total credits: 20
	NOTE: The achievement standards are examples that could be used to assess this programme. Not all aspects of the programme need to be formally assessed	

Return to previous page

Theme: Application of the four aspects of sustainability to the biophysical environment model

A one-year composite programme

In this example, students could be engaged in a programme in which level 7 and 8 learning objectives are used in the teaching and learning programme. Students could be assessed by either level 2 and/or level 3 EfS achievement standards.

	EfS Level 7 Composite – Biophysical Environment	EfS Level 8 Composite – Biophysical Environment
Term 1	LO 7.2 Students will gain knowledge, skills, and experience to investigate the aspects of sustainability in different contexts. Introduction to EfS aspects, key concepts, key principles, key terms and contexts. LO 7.3 Students will gain knowledge, skills, and experience to examine the values and behaviours that will contribute to a sustainable future. AS90813 Education for sustainability 2.3 Demonstrate understanding of how different personal values have implications for a sustainable future; Internal, 3 credits. The values and practices that support the use of alternative energy such as wind farms and the contribution to a sustainable future. Skills module: • Group work skills • Research skills • Report writing skills	Revisit EfS aspects, key concepts, key principles, key terms and contexts. LO 8.3 Students will gain knowledge, skills, and experience to analyse the values of different groups of people, how these values are expressed in various practices, and the present and future consequences for sustainability. AS91736 Education for sustainability 3.3 Analyse how different worldviews, and the values and practices associated with them, impact on sustainability; External, 4 credits. The values and practices that support the use of alternative energy such as wind farms, tidal energy, and their contribution to a sustainable future. Note: This achievement standard will be started here but completed in term 3. Skills module: • Strategy development skills • Report writing skills An example of a context for policy analysis could be riparian planting for the dairy industry. This would align with the level 7 context for AS91733 in term 3. Investigation/selection of worldviews for AS91736. It is very important to refer to both current

		specifications and explanatory note 5 for both standards before planning for the teaching of AS90831. LO 8.2 Students will gain knowledge, skills, and experience to analyse the impact of strategies and initiatives for a sustainable future. AS90832 Education for sustainability 3.5 Develop a strategy for an organization that will contribute to a sustainable future; Internal, 5 credits. The development of a strategy to raise awareness of potable water conservation in a drought-prone community or region; example, Canterbury.
Term 2	LO 7.4 Students will gain knowledge, skills, and experience to plan, implement, and evaluate personal action for a sustainable future. AS90810 Education for sustainability 2.1 Undertake a personal action, with reflection, that contributes to a sustainable future; Internal, 6 credits. The organisation of 350 event to raise awareness of the impact of fossil fuels and associated carbon emissions as contributors to global climate change. AS90811 Education for sustainability 2.2 Explain how human activity in a biophysical environment has consequences for a sustainable future; Internal, 4 credits. Investigation of modern landfill practices and the consequences for a sustainable future.	LO 8.4 Students will gain knowledge, skills, and experience to analyse actions necessary for sustainability and plan, implement, and critically evaluate personal action for a sustainable future. AS90828 Education for sustainability 3.1 Evaluate a personal action that contributes towards a sustainable future; Internal, 6 credits. The production of a film disseminated to an audience designed to raise awareness of increasing carbon emissions and the effect on sea level rise and global warming, the major effects of global climate change. LO 8.1 Students will gain knowledge, skills, and experience to evaluate social, economic, and technological measures that could be taken to sustain natural resources and improve biodiversity now and for the future. AS91735 Education for sustainability 3.2 Evaluate measures that may be taken to sustain and/or improve a biophysical environment; Internal, 4 credits. Evaluation of modern landfill practices; measures that could be taken to reduce the impact of waste on the biophysical environment; example, Kate Valley.

Term 3	Externals	Externals
	AS91733 Education for sustainability 2.4 Demonstrate understanding of initiatives that contribute to a sustainable future; External, 4 credits.	Two policies have been chosen and reviewed in detail in term 1 to reduce the preparatory workload in term 3 when developing/completing the written report for submission.
	With this external achievement standard also being resource based, preparation could include investigation into a range of initiatives relating to the biophysical environment; examples: • Riparian planting initiatives for the dairy industry • Native planting initiatives for communities • Domestic heating and associated air pollution initiatives	LO 8.3 Students will gain knowledge, skills, and experience to analyse the values of different groups of people, how these values are expressed in various practices, and the present and future consequences for sustainability.
	Don't forget to look at the Assessment Specifications for this standard.	AS91736 Education for sustainability 3.3 Analyse how different worldviews, and the values and practices associated with them, impact on sustainability; External, 4 credits.
	LO 7.2 Students will gain knowledge, skills, and experience to investigate the aspects of sustainability in different contexts.	Two worldviews have been chosen and reviewed in detail after having studied a range of worldviews in term 1. This serves to reduce the preparatory workload in term 3 when developing/completing the written report for submission.
	AS90814 Education for sustainability 2.6 Demonstrate understanding of aspects of sustainability in different contexts; External, 4 credits.	Note: AS91736 is a useful achievement standard by which to bring this programme to an end. Apart from being one of the two externals, the students have the opportunity reflect not only on a range of worldviews held by others but on their EfS learning and how this learning has impacted on the development of their own worldviews.
	All previous contexts provide relevant preparation for this resource based external achievement standard. An additional context that fits with the biosphere theme is the establishment of community gardens in New Zealand.	
Term 4	Revision for externals and practice of exam technique skills.	Completion of externals.
	Total credits: 21	Total credits: 19
	Note: The achievement standards are examples that could be used to assess this programme. Not all aspects of the programme need to be formally assessed.	

Return to previous page

Marlborough Girls' College Education for Sustainability programmes

Level 7 and 8

The two year levels focus on the local environment in the school's area. Logbooks are recommended for each of the internal standards and a system of milestones with regular personal contact with each student is important as they work through the standards.

The course provides many opportunities for enquiry-based learning with students exploring some of the global issues that their generation will be facing. It is imperative that in a sustainability course the students consider the issue of climate change and its implications.

Regional councils and local communities have people with diverse skills and knowledge who are willing to assist with sustainability activities. The example below made use of people from:

- DOC
- Sustainable wine growing
- Regional council policy writer
- Council hydrologist and environmental scientist
- Fonterra.

Level 7

The marine environment – The Marlborough Sounds

A field trip to the Sounds could include a visit to a salmon farm, other aquacultures, forestry (and the wilding pines that are an issue), Long Island Marine Reserve, and Kaipupu Point. The old whaling station could be included in the trip, as a nod to history and the way that human behaviour has changed. Using guest speakers allow students to experience many different points of view. The programme would be as follows:

- LO 7.2 Introduction to aspects of sustainability. Students investigate the aspects of sustainability through case studies and enquiry based learning, applying the aspects to local and global issues of sustainability.
- LO 7.1 Investigate the impact of humans on biophysical systems – students could select from aquaculture, forestry, fishing, effect of ferries, or other activities that are carried out in the Sounds. AS90811; 4 Cr
- LO 7.3 The values and subsequent behaviours of stakeholders in the aquaculture industry (Marine farmers, King Salmon Co, Sustain our Sounds Group, Guardians of the Sounds Group, Te Atiawa, Marlborough District Council). AS90813; 3 Cr
- LO 7.4 Students select an initiative that is being undertaken in the Sounds (Kaipupu Point Mainland Island, Marlborough Sounds Restoration Trust) and work through community groups to plan and carry out a personal action. AS90810; 6 Cr
- LO 7.2 The same initiatives and others (such as the Long Island Marine Reserve, or the Blumine Island project) used as case studies of initiatives that contribute to a sustainable future. This gives students experience in evaluating environmental initiatives in relation to a sustainable future. AS91733; 4 Cr; external
- LO 7.2 The whole year programme would contribute to students' understanding of the

aspects of sustainability and their interactions. Teaching and learning involves looking at global sustainability issues and relating them to local and NZ examples. AS90814; 4 Cr; external

Total: 21 credits

Note: The achievement standards are examples that could be used to assess this programme. Not all aspects of the programme need to be formally assessed.

Level 8

The freshwater environment – Water quality and quantity in Marlborough

A key focus on the impact of monoculture on water quality and quantity in Marlborough with field trips to a vineyard operation and a dairy farm – both of whom have been identified as using sustainable practices to mitigate adverse effects. Guest speakers could be used extensively. The level 8 course is open entry so there will be some revision of aspects of sustainability from level 7.

- LO 7.2 (revisited) Introduction to aspects of sustainability. Students examine the issue of Palm Oil production on a global scale and apply their knowledge to aspects of sustainability. Students are introduced to the ideas of critical thinking so that they can objectively assess the interaction of the aspects of sustainability and realise that the solutions are not simple, rather that they require compromise and trade-offs between the different aspects.
- LO 8.1 Evaluate measures that could be taken to sustain natural resources and improve biodiversity for a sustainable future. Students use bug boxes and complete a macroinvertebrate survey on a nearby stream to make the connection between biodiversity and stream health. Field trips support learning about mitigating the effects of monoculture on the soil, water and biodiversity. AS91735; 4 Cr
- LO 8.2 Analyse the impact of strategies and policies on a sustainable future. Students select from policies that relate to water quality in NZ, for example, the Sustainable Water Dairy Accord (previously the Clean Streams Accord), Fonterra company policy on clean water, Marlborough Council District Plan. The field trip and guest speakers from the Council and Fonterra would be important resources. AS90831; 5 Cr; external
- LO 8.4 Plan, implement, and critically evaluate personal action for a sustainable future. Students make a brief initial visit to Te Whanau Hou – the Grovetown Lagoon Project – a community wetland restoration project. They could listen to a speaker from DoC and choose an action that would contribute to the aims of the project. Students negotiate suitable times to carry out their planned personal action. AS90828; 6 Cr
- LO 8.2 Motivated students could work within the school to find stakeholders and plan a strategy that will contribute to a sustainable future. This could be a water use strategy, or students could come up with their own ideas without constraint. AS90832; 5 Cr

Total: 15-20 credits

Note: The achievement standards are examples that could be used to assess this programme. Not all aspects of the programme need to be formally assessed.

Return to previous page

Resources

- Assessment and professional support
- Resourcing ideas
- Ministry of Education websites
- Other government agency websites
- Other websites

Assessment and professional support

Assessment Online

- This key community covers assessment in the classroom, effective use of evidence, and reporting to families and whānau. It offers news, assessment tools and resources, research, a glossary, FAQ, and related links.
- The linked site Consider the Evidence promotes "evidence-driven decision making for secondary schools" and supports secondary educators in making best use of evidence to improve student achievement.
- For a view of how assessment can best serve learning, see Directions for Assessment in New Zealand, a report by Michael Absolum, Lester Flockton, John Hattie, Rosemary Hipkins, and Ian Reid (also available as a Word or PDF file).

Education Review Office

In 2007, ERO published reports on schools' effectiveness in the collection and use of assessment:

- The Collection and Use of Assessment Information in Schools
- The Collection and Use of Assessment Information in Schools: Good Practice in Secondary Schools

The New Zealand Qualifications Authority (NZQA)

Follow links to the National Qualifications Framework, NCEA, and subject achievement standards.

TOP

Resourcing ideas

AnyQuestions.co.nz

Students can go to this website to find useful, accurate, online information. Librarians from all over New Zealand are available each weekday between 1pm and 6pm to help students search online. To use AnyQuestions, students must be attending a New Zealand primary, intermediate, or secondary school or being home schooled.

The National Library of New Zealand Curriculum Services

Curriculum services support teaching programmes, including books and audiovisuals (videos/DVDs). Check out the website for services currently available.

Education for Sustainability

This website supports education for sustainability, which should be a starting point when looking for resources.

Social Sciences Online

This site provides pages specific to the following senior subjects: business studies, classical studies, economics, geography, history, and senior social studies (see links under 'Senior secondary' on the landing page).

Social Sciences Online also provides PDFs of titles in the Ministry of Education series Building Conceptual Understandings in the Social Sciences (BCUSS). (These are listed in 'Featured content', right navigation.)

- Approaches to building conceptual understandings
- Approaches to social inquiry
- Being part of a global community
- Belonging and participating in society

Although the BCUSS series is designed to help teachers of levels 1–5, it is strongly recommended to senior social science teachers.

Facing the Future

This website has resources for teachers and students – offers unit plans, student readings on various EfS topics.

Sustainability – Ed

This website supports sustainable development.

TOP

Ministry of Education websites

Ka Hikitia – Accelerating Success 2013–2017

Ka Hikitia – Accelerating Success 2013–2017 is a strategy to rapidly change how the education system performs so that all Māori students gain the skills, qualifications and knowledge they need to enjoy and achieve education success as Māori.

Key Competencies Online

This section of New Zealand Curriculum online offers specific guidance to school leaders and teachers on integrating the key competencies into the daily activities of the school and its teaching and learning programmes.

The New Zealand Curriculum Online

As well as the HTML version of The New Zealand Curriculum, this interactive site offers a variety

of support and strategies, news updates, digital stories of schools' experiences, and archived material relating to development of the curriculum.

Pasifika education plan 2013–2017

This site takes a closer look at the Pasifika Education Plan and the Pasifika Education Implementation Plan. It offers reflective questions, ideas, stories, and resources to support and inspire schools to make a difference for all Pasifika students.

Secondary middle leaders

A range of information, tools, and resources to support secondary middle leaders as they lead change in relation to The New Zealand Curriculum and Ministry of Education priorities.

Te Marautanga o Aotearoa

This site includes an English translation of the main sections of the marautanga. Only learning levels 1, 4, and 6 have been translated in the learning areas.

Te Tere Auraki

This Ministry of Education professional development strategy focuses on improving outcomes for Māori students in English-medium schools. This strategy supports four main projects: Te Kotahitanga, Te Kauhua, Ako Panuku, and Te Mana Kōrero.

BES (Iterative best evidence synthesis) programme

BES is a collaborative knowledge-building strategy designed to strengthen the evidence base that informs education policy and practice in New Zealand. See in particular: Effective Pedagogy in Social Sciences/Tikanga ā Iwi Best Evidence Synthesis Iteration [BES] (2008).

TOP

Other government agency websites

Parliamentary Commissioner

The Parliamentary Commissioner for the Environment has a number of publications and useful links for sustainability.

Climate change information New Zealand

This site offers information about New Zealand's emissions, emissions trading, projected impacts, international negotiations and obligations, and overall approach to climate change.

Department of Conservation

The department provides information and resources to support conservation education programmes in schools, including field trips and activities. Specific resources for level 2 have been developed, including one at Mt Cook Aoraki. This is targeted at geography but includes an assessment activity for AS90811. See also the Waitaki unit. This has a biology angle about endangered species.

Landcare Manaaki Whenua

This environmental research centre specialises in sustainable management of land resources optimising primary production, enhancing biodiversity, increasing the resource efficiency of businesses, and conserving and restoring the natural assets of our communities. The website includes a comprehensive education section.

Ministry for Primary Industries Manatū Ahu Matua

This is a very useful website that has up to date information and resources.

Ministry for the Environment Manatū mō te Taiao

MfE's mission is environmental stewardship, kaitiakitanga, for a prosperous New Zealand. Reference to the Resource Management Act 1991 (RMA) is included.

National Institute of Water and Atmospheric Research (NIWA)

NIWA is New Zealand's leading provider of atmospheric and aquatic science. The website includes research, educational material, publications, maps, FAQ, teachers' and students' sections, and links to the various NIWA national centres and information about the Intergovernmental Panel on Climate Change (IPCC).

Statistics New Zealand

Search for sustainability or population or explore the schools corner.

TOP

Other websites

The following websites have been recommended as helpful by teachers.

New Zealand organisations

Enviroschools Foundation

The foundation is a charitable trust that provides support and strategic direction for a nationwide environmental education programme. The Foundation's vision is to foster a generation of innovative and motivated young people who instinctively think and act sustainably.

Environmental Defence Society

An environmental organisation comprised of resource management professionals who are committed to improving environmental outcomes.

Forest and Bird

Forest and Bird works to preserve New Zealand's natural heritage and native species. They also co-ordinate hands-on restoration projects and educate people about environmental issues through their children's club, Kiwi Conservation Club, publications, and public awareness campaigns.

Greenpeace New Zealand

Greenpeace has campaigned on many environmenatal issues over the years. This website is its New Zealand portal.

LEARNZ

LEARNZ runs virtual field trips throughout the school year. This website includes background resources, student activities, teacher support, and curriculum ideas, and it prepares students for the field trips in the weeks leading up to the virtual field experience.

New Zealand Association for Environmental Education

NZAEE is a non-profit organisation working to promote and support environmental education, lifelong learning, and sustainable behaviour throughout New Zealand/Aotearoa. It provides information on a wide variety of environmental issues for individuals, schools, community groups, and businesses.

Sir Peter Blake Trust

The trust aims to help New Zealanders make a positive difference to the planet through activities that encourage environmental awareness and action. In partnerships with the Ministry of Education and NIWA, it administers the Sir Peter Blake Environmental Educator Award, and the Sea and Learn hands-on science shipboard education programme, and also supports young New Zealanders to attend the United Nations Environment Programme International Children's Conference on the Environment, which is held every two years.

Sustainable Living Trust

This national organisation provides resources for community education but has available teaching resources designed specifically for use in a level 2 NCEA classroom, which can be requested through the site.

Trade Aid

Trade Aid offers free educational resources on social justice issues such as fair trade, international trading rules, business models, slavery, environmental justice, education, and gender equity. Curriculum-based units are available for levels 2–8.

Transition Towns Aotearoa

This social networking site links the various groups and organisations around New Zealand transitioning toward a post-peak-oil future.

World Vision New Zealand

World Vision provides an educational experience for students about world issues. A variety of resources includes Internet connections, simulation games, posters, and NCEA internal assessments with teacher resource folders. Most of these are free to download, while others can be purchased online.

WWF New Zealand

WWF New Zealand promotes positive action to reduce the impacts of climate change, campaigns to stop dolphins and seabirds being caught by fishers, and educates the next generation about the importance of managing our precious environment more sustainably.

TOP

Advocacy

Change Agency Education and Training Institute

This agency is an independent activist education initiative working in the Australia-Pacific region to help people achieve social and environmental change. The resources include interesting readings, workshop tools, and key ideas for taking action that support development of key competencies. The agency's byline is "listen deeply, reflect critically, strategise effectively, make change happen".

Friends of the Earth

This website links to a large variety of downloadable resources, many of which bring together social justice and environmental issues.

Amnesty International

Amnesty International campaigns on a wide range of issues to protect and defend human rights.

Future scenarios

This site offers a variety of scenarios about possible responses to peak oil and climate change. There is a great deal of reading but also an illuminating photo gallery. The information is from the perspective of a highly committed 'green' – David Holmgren, co-originator of permaculture.

GreenChoices

GreenChoices is about the choices we can make in our everyday lives to protect our environment, providing simple, direct information on green alternatives, which make a real, lasting difference.

International Geosphere-Biosphere Programme

This site includes an excellent education section with resource books on climate change and a downloadable executive summary.

TOP

Climate change

Ministry for the Environment

This section of the Ministry for the Environment website outlines implications of climate change for New Zealand, what New Zealand is doing about it, and their reporting commitments.

Intergovernmental Panel for Climate Change

The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts. In the same year, the UN General Assembly endorsed the action by WMO and UNEP in jointly establishing the IPCC.

CarboNZero

This site describes various events, organisations, and individuals meeting the carbon challenge. Through this programme, people can buy and sell carbon credits.

Climate change education

This site is supported by the American-based action group Focus the Nation and Climate Change Education.org, a group from the University of California, Berkeley. It is a portal site dedicated to education on climate change, offering a variety of K–12 resources, both interdisciplinary and subject specific, together with links to videos, experiments, and other sites of interest.

TOP

Ecological footprints

Disposable Planet

A six-part BBC series on sustainable development.

Earth Day

This American site currently offers calculators for three countries – the United States, Canada, and Australia.

Greendex (National Geographic)

The Greendex is a quantitative consumer study of 17 000 consumers in a total of 17 countries (14 in 2008), who were asked about such behaviour as energy use and conservation, transportation choices, food sources, the relative use of green products versus traditional products, attitudes towards the environment and sustainability, and knowledge of environmental issues.

Redefining Progress

This American-based public policy thinktank is dedicated to smart economics. They work to find solutions that ensure a sustainable and equitable world for future generations.

Food and gardening

Earthday Network

The Earthday Network works in partnership with the United States Green Building Council (USGBC) and the Clinton Foundation with the aim of greening all of America's K–12 schools within a generation.

Garden Organic UK

This comprehensive site advocates for gardening in schools and provides a wealth of information on how to get started and the links that can be made to curriculum (UK) outcomes. This site includes stories from schools involved with the programme.

Kitchen Garden Foundation

This Australian site advocates for edible gardens in school but also provides resources for schools wanting to develop integrated programmes around food growing. The programmes develop numerous competencies among children and build understanding of the importance of food culturally as well as economically.

Organic Pathways

Part of the Organic Garden City Trust, this Christchurch group was set up in 1997 to support schools to set up an edible garden.

Celsias

Practical things to combat climate change.

TOP

Population

Population Growth over History

(The University of Michigan's Global Change Curriculum.) This site includes an interactive map, which shows how rapidly population has grown in the past 200–300 years. The lecture paper covers the following topics: how fast the human population has grown, what the world's population is likely to be in the future, the forces responsible for population, the 'demographic transition', and what we can learn from models of future population growth.

World Population Awareness

The goal of this website is to preserve the environment and its natural resources for the benefit of people today and future generations. It offers discussion papers and statistical information that focus on population growth and excessive consumption. This site could be a useful resource for students investigating population issues and wanting opinion pieces.

World Population Trends

This site offers a comprehensive selection of statistical data on every nation in the world, illustrated by wall charts, graphs, and tables. Themes include mortality and migration, fertility and family planning, and population and development.

Urban sustainability

Carfree.com

This website supports the book Carfree Cities. This organisation aims to remove cars from central cities to make them safe and pleasant for pedestrians and to build communities where walking, cycling, and public transport predominate. See also Worldcarfree.net (below).

Megacities Project

This transnational, non-profit network of leaders from government, business, non-profit and grassroot groups, academia, and the media share innovative solutions to the problems they face in common.

SmartGrowth Online

This site outlines how cities can redevelop to outsmart sprawl. It is American based, but much of what is discussed is relevant to New Zealand.

Sustainable Cities

This small organisation, based in Canada, tackles the challenges of urban sustainability. Sustainable Cities is a think tank and active peer-learning network covering 38 cities in 14 countries. There are many useful links to research and actions that may be useful for the classroom.

United Nations Human Settlements Programme: UN-HABITAT

This international agency provides support for urban change – they have many projects on the go that cover such topics as cities and climate change, social inclusion, and water and sanitation.

Worldcarfree.net

Worldcarfree.net is a clearinghouse of information from around the world on how to revitalise our towns and cities and create a sustainable future. This site offers resources for teachers, students, and other engaged citizens.

TOP

Youth support and action

Good magazine

A New Zealand guide to sustainable living.

Green generation (Earth day network)

Resurgence

TakingItGlobal

This is the largest online community of youth interested in global issues and creating positive change.

Yes!

This American-based site offers both subscription and free access, and provides searchable resources for students undertaking research.

Sustainability case studies

Nike

The Body Shop

Green Globe

The Natural Step

Sustainable Coastlines

Leonardo Dicaprio Foundation

Auckland City Council Environmental Programmes

Environment Canterbury Regional Council