

DRAFT

Conceptualizing Environmental Learning



2006

An Interdisciplinary Guide For Teachers

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Introduction and Background

Do you want to find a better way to organize your teaching and lesson planning?

Do you want to be part of positive change from within the education system?

Do you want to empower your students to become environmentally responsible?

If you answered yes to any of the above questions, this document is for you. It is provided to assist teachers of all subjects and grades to integrate environmental concepts into teaching and learning. Designed as a support framework to guide teachers in their education planning, the guide also aims to support the implementation of many of the IRP's in new and revised curriculum and will be complemented by web resources which cross reference aspects of environmental learning in current and revised versions of the provincial IRP's in diverse subjects as science, social studies and the language arts. It is your guide to interdisciplinary practice — using the environment as an organizing theme.

This guide also builds on an earlier Ministry of Education document, *Environmental Concepts in the Classroom: A Guide for Teachers*, first published in 1995. This guide and the preceding document were developed in the belief that students should understand how and why the environment has an impact on their daily lives and what kind of an impact their daily lives have on the environment. This guide continues with an integrated approach towards environmental learning because so many of the subject areas touch on environmental topics or experiences in some way. By emphasizing that the study of 'environment' is not a unique subject area, it is hoped that students will come to understand how their actions affect both local and global environments.

Since the first BC framework document in 1995, there continue to be many and varied developments for the field of environmental education. These ideas have been informed by International agreements such as



the Kyoto Protocol, Montreal and Johannesburg Summits on Sustainable Development and the more recent proclamation of the United Nations Decade of Education for Sustainable Development (2005-2014). This momentum has been accompanied by a great deal of research on how people learn in a variety of disciplines. Still, all environmental learning (whether it be in the form of Environmental Education, Ecological Education or Education for Sustainable Development) aims to integrate environmental thinking and ideas into students' everyday lives. In this way, it is hoped students will begin to realize how they can take personal responsibility and leadership in creating a more environmentally sustainable way of life.

This revised document offers at once a conceptual framework for introducing environmental learning in all classrooms, while providing several general principles of teaching and learning to guide teachers in designing integrated activities for a variety of learning contexts. In addition, the document provides a number of perspectives around which environmentally-focused lessons may be conceptualized. These multiple and overlapping perspectives can assist teachers in facilitating students' varied conceptions of environment. For example, students' conceptions of environment could incorporate other forms of cultural knowledge such as aspects of Traditional Ecological Knowledge (TEK), practised by the first peoples of an area or region of the province. The appendices contains many weblinks and other suggestions for study themes or implementation guidelines to organize environmental learning. It also includes a bibliography to assist teachers in their continued professional development.

Why Learn About Environmental Issues?



There continues to be growing concern about the state of the environment, yet we are often confused by the complexities of economic, ethical, political, and social issues related to it. Daily, there are references in the news media to environmental issues such as global climate change, ozone depletion, dwindling resources, famine, disease, loss of biodiversity, pollution, and continuing job losses in many BC communities. The problems we face both as individuals and within our broader society are now so pervasive and ingrained within our cultural ways of being that we can no longer look to science and technology alone to solve these problems. As a consequence, environmental learning can and should include a sustained critique on dominant societal and industrial practices that often contribute to widespread and localized environmental problems.

We must also turn to ourselves as individuals and as educational professionals to make change and develop a new ethic - a responsible attitude toward caring for the earth. Working to integrate environmental learning within all subject areas promotes this change in attitude by providing students with opportunities to experience and investigate the relationships linking individuals, societies, and natural surroundings. Education 'about', 'in' and 'for' the environment provides students with opportunities to learn about the functioning of natural systems, to identify their beliefs and opinions, consider a range of views, and ultimately make informed and responsible choices for themselves, their families and communities.

In 2002, the Canadian government developed a broad vision for Environmental Learning in Canada through the development of the document: *Environmental Learning for a Sustainable Future*. This vision relates that Canadians of all generations and from all sectors of society should be given opportunities to engage in environmental learning within and beyond

the classroom walls where critical questions can be asked and a sustained and meaningful dialogue can take place. The document states that *with increased awareness, knowledge, skills, attitudes, values, and motivation, Canadians can become more ecologically literate and act competently to build a sustainable future for humans and ecosystems.*

The Canadian framework also relates that the vast majority of Canadians consulted prior to its publication reported that environmental learning *must be inextricably linked to values and ethical ways of thinking.* The document states clearly the idea that no learning can be value-free and that citizens as they are engaged in the life of their communities; are participants in the discussions, debates, and decisions that will shape their future. As educators we can and should find ways to present aspects of environmental and sustainability concepts that will allow learners to draw their own conclusions about important environmental and societal issues.

Education, Environment and Sustainability



Environmental education can be described as a way of understanding environments, and how humans influence these environments. It aims to integrate concepts and principles of the sciences and social sciences such as ecology, biogeography, sociology, environmental chemistry, environmental psychology, politics, and economics (to name only a few) under a single interdisciplinary framework. In so doing, environmental education can provide students with opportunities to learn about their connections to the natural environment through traditional subjects and through direct experience in both natural and human designed systems. In the ecological view, students may come to know and understand more deeply that all human environments, societies or cultures are deeply embedded (and dependent on) natural systems both for their development and continued survival.

The term *Sustainability* or the more recent: *Education for Sustainable Development*, is another important (though contested) idea related to human integration and interaction with the environment. The idea of making sustainable choices for example, might force us to look at issues such as the scale of present day economic activity within a connected and increasingly global environment. In the original *Environmental Concepts in the Classroom* document, the idea of sustainability was seen to explore the relationship between social, economic and environmental factors *for the well-being of the human species*. It related that thinking about sustainability forces us to examine the ability of the environment to continue to provide for all species, both today and in the future. Some continued issues for consideration and discussion around the idea of sustainability include: stewardship; shared responsibility; short- and long-term consequences; waste management; socially responsible and ethical economics; conservation and restoration of the environment; energy and resource management; the relationship

of technology and innovation to the environment; global awareness; and international responsibility.

In the preamble to the proclamation of the United Nations Decade of Education for Sustainable Development (2005-2014), it states unequivocally that *there is no universal model of education for sustainable development*. It relates that there will be nuanced differences according to local contexts, priorities and approaches in how sustainability will be taken up. It further states that the underlying values which *education for sustainable development* of any kind must promote include the following: Respect for the dignity and human rights of all people throughout the world and a commitment to social and economic justice for all; respect for the human rights of future generations and a commitment to intergenerational responsibility; respect and care for the greater community of life in all its diversity which involves the protection and restoration of the Earth's ecosystems; and finally, respect for cultural diversity and a commitment to build locally and globally a culture of tolerance, non-violence and peace. As such, the UN proclamation represents a new vision of education, a vision that emphasizes a holistic, interdisciplinary approach to developing the knowledge and skills needed for a sustainable future as well as the necessary changes in human values, behaviour, and lifestyles. These are principles that are also supported by British Columbia educators in this locally developed framework for environmental learning.

Principles for Integrating Environmental Learning



In this framework, the following principles work together to integrate environmental learning by connecting diverse subject areas for students from kindergarten to post-secondary levels. These principles are presented to assist teachers both in the design of instructional strategies and in the critical use of learning resources. By facilitating environmental education in the learning of all subjects rather than isolating it, students begin to realize how the environment is connected to their daily lives and relationships within their communities. The principles of environmental learning are organized into two related areas: first, the widely supported principles for teaching and learning of *direct experience*, *critical reflection* and *negotiation* are related and described; second, some organizing principles for learning environmental concepts are summarized and described. This organization at once demonstrates the interdisciplinary nature of environmental concepts, while showing a progression for the development of ideas that can lead towards deeper engagement with environmental learning in all of its forms.

Teaching and Learning Principles

In describing basic principles for environmental learning, it is generally recognized that teaching could at once be described as both *art* and *science*. Environmental learning therefore, considers multiple models for teaching and learning, as well as teachers' own pedagogical content knowledge — that unique blend of disciplinary knowledge combined with teachers' knowledge about specific learning contexts. While some guiding principles can be helpful, they are seen as a starting point as new and experienced teachers will develop what can be described as a personal 'teaching style' that reflects their current experiences and ideas about teaching and learning.

Whatever methodologies are used, it is acknowledged that students *direct experience* with a concept or problem, followed by opportunities for *observation*, *reflection* and *negotiation* leading to further inquiry, are the richest forms of learning.

DIRECT EXPERIENCE

Direct experience with the environment, both individually and in groups, is an important and vital way to learn. Such opportunities must be provided for the studies to be relevant, because they help provide students with a deeper understanding of natural systems and the impact humans have on those systems. Direct experience then allows students opportunities to challenge previous cultural conceptions held regarding environmental problems.

CRITICAL REFLECTION AND NEGOTIATION

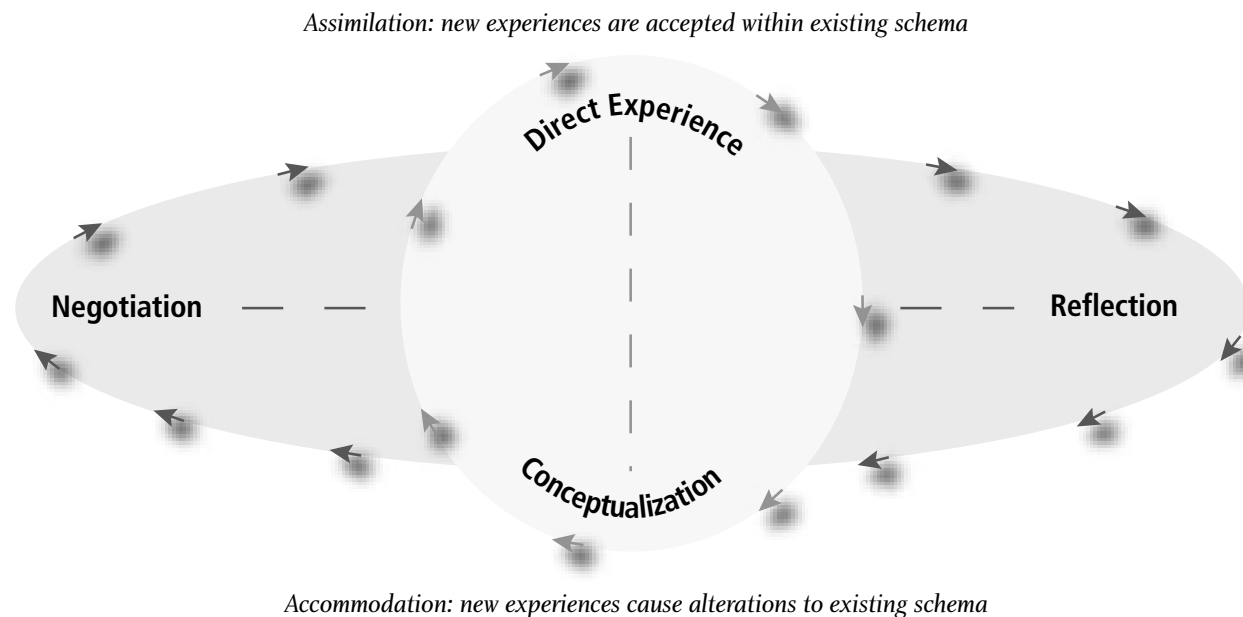
For direct experience to be deeply meaningful to students, the development of critical and reflective capacity is also vital. When students are given adequate time to reflect on their learning, they learn to evaluate these ideas both against their own experiences and the experiences of others. Central in this is the notion of allowing students to negotiate among multiple perspectives or conceptions about environmental problems.

EXPERIENTIAL LEARNING CYCLE

A view of teaching and learning which incorporates the centrality of direct experience, critical reflection and negotiation for the learning process has been summarized in a model described as the *experiential learning cycle*. The model is informed by a broad range of research from the cognitive sciences and is further supported by experiential and socio-constructivist views about teaching. Methodology typical to a learning cycle approach includes: (1) the selection of an appropriate experience embodying the concept to be taught; and (2) students attempting to explain this experience and evaluating each other's concepts against other students' ideas and with direct experience.

In this model, environmental knowledge is not to be viewed as stable and often can be conjecturable as our developing knowledge grows from exposure and experience. Students' experiences are received through their existing knowledge structures (termed assimilation) and in the case of misconceptions, these structures may be reshaped to accept new experiences (termed accommodation). In the learning cycle model, teachers emphasise thinking, understanding and self-control for their students, over other behavioural approaches centred on discipline, punishment or reward strategies. Students are viewed as constructors of their own knowledge rather than reproducers of others' knowledge. Further ideas related to this approach towards learning are described in the following section.

Figure 1: THE LEARNING CYCLE



SUGGESTIONS FOR PRACTICE

The following are useful to consider in the design of learning experiences for students:

Learning should encourage the integration of subjects/multidisciplinary approaches

Environmental education may be envisioned to be an example of cross-curricular or integrated learning.

Learning should encourage critical reflection on a range of perspectives

Education differs from indoctrination in that it provides a range of perspectives and viewpoints. It is important to provide the tools to think critically and to analyse issues.

Issues should be examined for their currency and authenticity

In the study of issues and concerns related to the environment, it is important to stay current and have students engage with authentic issues of importance in their community

Learning should acknowledge Aboriginal perspectives

In learning about environmental issues, the First Peoples Traditional Ecological Knowledge (TEK) of specific landscapes, regions or ecologies can be an important component of culturally appropriate, and responsive, environmental education.

Learning should acknowledge other perspectives

BC is a multicultural province, and there are diverse perspectives on the environment, which are different from Euro-Canadian perspectives. In addition, it is important that other cultural and religious perspectives are acknowledged, respected, and analysed in terms of their implications for issues.

Learning should consider the place of action

Taking personal responsibility for one's actions is the hallmark of the educated person. It is important for students to understand the variety of ways in which action can take place and the consequences of different strategies.

Consideration of issues should include both local and global perspectives

While much educational activity will be locally focused, there is great need for a global perspective in education programs. Actions taken at a local level have global ramifications.

Environmental learning should occur within a context of hope

Thinking and communication about the environment sometimes focuses on an extreme "doom and gloom" scenario for the future of the planet. Teachers should encourage a more positive outlook and focus on the challenge and excitement of exploring solutions to complex problems.

Environmental learning should encourage humility

One aspect of the human world view that has contributed to many of our environmental problems is the idea that nature should be controlled by humans. Humility can help humans understand how they can live in balance with nature.

Principles for Conceptualizing 'Environment'

While direct experience, critical reflection and negotiation provide unique opportunities for learning, engagement with other (multiple) perspectives on environment can help to expand and inform students conceptualization of environmental issues. As a way of focusing this type of inquiry, further key principles for 'conceptualizing' environment are presented here (see Figure One for a representation of how this connects to experiential learning). Through a consideration of these principles for environmental education, teachers come to understand that experiential programs can examine the complexity of natural systems, and how humans interact with and effect those systems. They also learn that holistic forms of environmental education can help students to develop a sense of respect and appreciation for the natural world. An *aesthetic* appreciation, along with a scientific understanding of nature encourages students to learn and act to protect and sustain the environment, and can contribute to self-awareness and personal fulfilment.

Responsible action is also seen as integral to, and a consequence of, environmental education. As educators, we need to facilitate students' understandings of what constitutes responsible action toward the environment and help students to practice it in their personal lives. These actions are influenced by belief systems and personal limitations (physical and cultural) and so this action can take many forms. Lastly, the study of environmental issues can enable students to develop what has been described as an *environmental ethic*. Responsible action requires an examination of values and a consideration of environment should provide opportunities to question cultural assumptions that give rise to social conflict and environmental crises. Teachers should encourage students to make decisions

based on an understanding of the issues as well as their personal values, and the sometimes conflicting values of other community members.

The principles for organizing and conceptualizing environmental education then include: a consideration of *complexity* (complex systems); *aesthetics* (or aesthetic appreciation); *responsibility* (responsible action and consequences of action) and the practice of an environmental *ethic*. We use the mnemonic and metaphor of *C.A.R.E.* (Complexity, Aesthetic, Responsibility and Ethics) to describe these various forms environmental knowledge can take. This organizer at once demonstrates the interdisciplinary nature of environmental concepts, while showing a progression for the development of ideas that can lead towards progressively deeper engagement with environmental learning in all of its varied forms (see Figure 2). This guide continues with a consideration of each of these types of environmental learning.

Figure 2: Use 'CARE' to deepen environmental learning



COMPLEXITY

Life on Earth depends on, and is part of, complex systems:

Environmental education addresses the study of complex systems in two ways. First, it examines the complexity and interrelatedness of natural systems, and how humans interact with and affect those systems. It also looks at human-created systems, both those that are built and those that are part of our social fabric. For example, when students investigate the water cycle, a food web, or photosynthesis, they are studying a natural system. When they investigate government and politics, economics and the evolution of societies, or highway and sewage systems, they are studying human-created systems. These investigations help students identify the complexity of systems and the links between them. Knowledge from a broad range of scientific disciplines contributes to a well-rounded understanding of environmental issues. However, there must be an awareness that knowledge is not static and that theories change. Knowledge from the sciences, along with that from economics, politics, law, and sociology, is vital to the study of complex systems and human interactions.

By developing insights into cultural systems and global issues, students may understand the relationships between human rights, justice, race and gender equity, and the environment. Other cultures in the world present valuable perspectives on ways of valuing and relating to natural and built environments. In developing a thorough understanding of systems, students can examine the origins and impact of their present worldview and analyse the implications of new information and changing societal values. Concepts for student consideration and discussion include: An ecosystem, or a social system, is derived from the collective interactions of individual parts that require holistic investigation.

- Individual components serve unique functions in all complex systems. The loss or degradation of any single component may cause a decline in the viability of the system.
- The planet's resources are finite. Humans are dependent on materials and energy supplied by the global ecosystem.
- Different cultures observe natural systems through various philosophical, technological, and social points of view. Throughout time, cultures have interacted with the environment in different ways.
- The pace of technological change and distribution of scarce resources can have a profound impact on society and the environment.
- The organization of societies in the past and present and the laws that govern them have implications for environmentally and socially sustainable development.



AESTHETICS

Environmental awareness enables students to develop an aesthetic appreciation:

Aesthetics deals with beauty, artistic expression, and our physiological responses to these. Environmental education helps students to develop this aesthetic sense of respect and appreciation for the natural world through study, physical challenges, and other experiences in nature. An aesthetic appreciation, along with other understandings of nature, encourage students to learn and act to protect and sustain the environment, and can also contribute to self-awareness and personal fulfillment. Further, outdoor studies and activities in physical or outdoor education can help develop this aesthetic appreciation. Aesthetics in the deeper sense also have an internalized component strongly related to that which we personally value in nature.

Aesthetic values may explore explicit value shifts such as those found, for example, in recent attempts to develop the idea that nature (or parts of nature) has fundamental worth. Very different types of value shifts are also possible in environmental aesthetics and environmental criticism in the arts, however, these often concentrate on cultural expressions of our interaction with nature. Finally, aesthetic experiences provide insight and enrich human interactions with the environment by allowing students to: develop an understanding of aesthetic qualities that exist in the environment; develop skills and sensitivity to the application of aesthetic criteria to environmental concerns, and to develop the ability to formulate, apply, and communicate personal aesthetic criteria for assessing environmental issues.

Concepts for student consideration and discussion include:

- Direct experiences in natural surroundings provide opportunities for

students to develop respect and appreciation for living and non-living things.

- Aesthetic appreciation encourages a sense of the uniqueness and beauty of the planet.
- Appreciation of nature is an impetus for many forms of creative expression.
- Individuals and cultures vary in the degree to which they value nature for its own sake and for its ability to serve human needs.
- The lifestyles, arts, and religions of a people can be indicators of their perception of, and relationship with, their environment.
- Respect for the land and all living things can encourage the maintenance of a healthy environment, providing benefits for everyone.



RESPONSIBILITY

Human decisions and actions have environmental consequences:

Studies about the environment provide opportunities for students to explore the environmental impact of decisions and actions made at personal, community, societal, and global levels. The histories of all societies reflect the interactions of individuals and groups with their environment. Studies in geography, history, technology, and other arts and sciences can help to develop awareness of diverse cultural perceptions and interpretations of the environment. Through the study of human impact on the environment, students can explore and develop positive approaches to long-range environmental concerns. Exploring and addressing global issues such as militarism and war, the inequitable distribution of wealth and resources, food production, and transportation is essential to establishing a sustainable society. A focus on decisions and actions in other cultures and locations contributes to questions about how to live more sustainably here in BC.

Concepts for student consideration and discussion include:

- A basic value for every society is preservation of viable ecosystems.
- First Nations practise of Traditional Ecological Knowledge can illustrate alternative views on how humans have interacted with their environment
- Consideration for future generations of all species is essential to preserve the integrity of the ecosphere
- The language used by a culture unconsciously reproduces its moral values
- Some human actions have significant and cumulative impacts on the environment. Growth in population and resource consumption is

exponential. Most contemporary societies produce wastes, consume resources, and/or add to their population at rates that cannot be sustained.

Responsible action is integral to, and a consequence of, environmental education:

In light of what we know about past decisions around environmental issues, it is vital for students to decide what constitutes responsible action toward the environment now and begin to practice it. Concepts for student consideration and discussion here include: There are consequences and responsibilities for any action or inaction. Actions are influenced by belief systems and personal limitations, both physical and cultural. Responsible action requires an understanding of factors that influence the environment and those that regulate, influence, or govern human interaction with the environment. These include the law, government and politics, civic responsibility, the decision makers, and those who influence them.



ETHICS

The study of the environment enables students to develop an environmental ethic:

Supporting students to take responsible action requires an examination of values. Environmental education provides an opportunity to question cultural assumptions that give rise to social conflict and environmental crises. The questioning process can create new visions and possibilities, but it is also important for students to realize that issues and crises are the result of our values. Students should be encouraged to make decisions based on an understanding of the issues as well as their own values, and values of community members. Knowledge of philosophical and critical thinking tools such as perspective analysis, argument analysis, and message deconstruction provides a means to assist with the decision-making process as well as other disciplines.

Some issues for an analysis of values could include economic growth and sustainable development, land ownership, business ethics, consumption patterns and lifestyles, technological change, pollution, violence in society, the role of the media, and population control.

Concepts for student consideration and discussion include:

- Actions are generated by belief systems or sets of values.
- Value systems can change over time.
- The formation of values occurs in stages.
- How the environment is affected by specific actions is a scientific question, but the choice of what action to take is a question of ethics and of cultural, religious, and/or personal values.

- Human quality of life is influenced by environmental quality.
- Humans must recognize their responsibility to future generations.
- Societal attitudes toward the environment are influenced by mass media coverage and perspectives.
- Print and electronic media have commercial implications and contain ideological and value messages that have social and political implications.

The development of an environmental ethic in students is perhaps a culminating goal for environmental learning in that it requires an understanding of all of the previous forms of environmental concepts described. Understanding the complexity of our daily interactions while recognizing the aesthetics of one's environment will lead to students taking active responsibility in moving forward change. When this happens, an environmental ethic can become part of the moral fibre of a person's identity.



Summary of Environmental Learning Principles



As intended, this document has been constructed to assist teachers of all subjects and grades to integrate environmental concepts into teaching and learning. As a curriculum support framework, the next step will be to link this document to dynamic support pages on the web which will provide teachers with curriculum links, lesson ideas and other resources supporting environmental learning. These will be cross referenced with aspects of environmental education in current and revised versions of the provincial IRP's in diverse subjects such as the sciences, social studies, and the fine and language arts.

This document has described how environmental education can be described as a way of understanding environments, and how humans are part of, and influence these environments. In using the term 'environmental learning,' we refer at once to a range of approaches to environmental issues including environmental education, ecological education and education for sustainable development. All of these forms aim to integrate concepts and principles of the sciences and social sciences under a single interdisciplinary framework. In the ecological view, students may come to know and understand more deeply that all human environments, societies or cultures are all deeply embedded on natural systems both for their development and ultimately their survival.

In this framework, we presented numerous principles for organizing teaching practices related to the environment. These principles are organized into two areas. First, the widely supported principles for teaching and learning of *Direct Experience*, *Critical Reflection* and *Negotiation* are related and described in the form of the Experiential Learning Cycle model. Second, organizing principles for environmental concepts were also summarized and described. This organization at once demonstrates the interdisciplinary nature of environmental concepts, while showing a progression for

the development of ideas that lead towards deeper engagement with environmental learning in all of its forms. Students are assisted by the organizers of Complexity, Aesthetics, Responsibility and Ethic (CARE) to guide their developing conceptualizations of environment. We hope that this document is useful in assisting teachers in their important task of incorporating environmental themes into teaching and learning.