

2008

Resource Guide

The Ontario Curriculum
Grades 1-8

Environmental Education

Scope and Sequence
of Expectations



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PREFACE

The Report of the Working Group on Environmental Education, entitled *Shaping Our Schools, Shaping Our Future*, provides the framework for the scope of environmental education in Ontario schools. The report defines “environmental education” in the following way:

Environmental education is education about the environment, for the environment, and in the environment that promotes an understanding of, rich and active experience in, and an appreciation for the dynamic interactions of:

- The Earth’s physical and biological systems
- The dependency of our social and economic systems on these natural systems
- The scientific and human dimensions of environmental issues
- The positive and negative consequences, both intended and unintended, of the interactions between human-created and natural systems.¹

The report emphasizes the necessity of ensuring that young people become environmentally literate. Students need to have the knowledge and skills that will enable them to understand and deal with complex issues that affect the environment now and in the future. For example, students need to develop skills in problem solving, inquiry, decision making, action planning, higher-level thinking, systems thinking, and critical literacy. They also need to be able to identify issues and perspectives, carry out research, and communicate their ideas in meaningful ways. In short, they need to develop the knowledge and skills that will enable them to become informed, engaged, and responsible citizens who are concerned about diverse environmental issues.

The report also promotes study of environmental topics and issues in a variety of contexts – for example, in the outdoors or in hands-on and experiential contexts.

This resource document has been prepared to assist teachers in bringing environmental education into the classroom in each subject area in Grades 1 to 8. In the elementary curriculum, most of the expectations connected explicitly with aspects of environmental education are in the science and technology curriculum and the social studies, history, and geography curriculum. In the other subject areas, connections can be made to environmental topics or issues in various ways, and some suggestions for making such connections are given in brief comments. Expectations that are listed in this resource document are taken from the following Ontario curriculum policy documents:

- *The Ontario Curriculum, Grades 1–8: Science and Technology, 2007* (revised)
- *The Ontario Curriculum: Social Studies, Grades 1 to 6; History and Geography, Grades 7 and 8, 2004* (revised)
- *The Ontario Curriculum, Grades 1–8: Health and Physical Education, 1998*
- *The Ontario Curriculum, Grades 1–8: The Arts, 1998*

¹ *Shaping Our Schools, Shaping Our Future: Environmental Education in Ontario Schools*, Report of the Working Group on Environmental Education (Toronto: June 2007), p. 6.

- *The Ontario Curriculum, Grades 1–8: Mathematics, 2005* (revised)
- *The Ontario Curriculum, Grades 1–8: Language, 2006* (revised)
- *The Ontario Curriculum, Grades 1–8: Native Languages, 2001*
- *The Ontario Curriculum: French As a Second Language – Extended French, Grades 4–8; French Immersion, Grades 1–8, 2001*
- *The Ontario Curriculum: French As a Second Language – Core French, Grades 4–8, 1998*

Expectations are organized by grade and by subject area within each grade in the lists on the following pages. The subject areas that have the most connection with environmental education are presented first in each grade. The eight subject areas are presented in the above order. Expectations are given under the name of the strand in which they appear in the curriculum policy document. For the purposes of this document, the text that normally precedes the expectations (“By the end of Grade x, students will”) has been omitted.

Note also that expectations are cited in the way in which they appear in the various documents, as follows:

Overall and specific expectations from the revised *Language* (2006) and *Science and Technology* (2007) documents are identified by number (e.g., “**1**”, “**1.1**”, “**1.2**”).

Expectations from all other documents listed above are identified as follows:

- for overall expectations
- for specific expectations

GRADE 1

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: NEEDS AND CHARACTERISTICS OF LIVING THINGS

- 1** assess the role of humans in maintaining a healthy environment
- 1.1** identify personal action that they themselves can take to help maintain a healthy environment for living things, including humans (*e.g., walk to school instead of being driven in the car; be careful what they put down the drain at home; practise cleanliness to reduce the spread of germs when helping in the kitchen; show care and concern for all living things*)
- 1.2** describe changes or problems that could result from the loss of some kinds of living things that are part of everyday life (*e.g., if we lost all the cows, all the insects, all the bats, all the trees, all the grasses*), taking different points of view into consideration (*e.g., the point of view of farmers, children, parents*)
- 2** investigate needs and characteristics of plants and animals, including humans
- 2.2** investigate and compare the basic needs of humans and other living things, including the need for air, water, food, warmth, and space, using a variety of methods and resources (*e.g., prior knowledge, personal experience, discussion, books, videos/DVDs, CD-ROMs*)
- 3** demonstrate an understanding of the basic needs and characteristics of plants and animals, including humans
- 3.1** identify *environment* as the area in which something or someone exists or lives
- 3.4** describe the characteristics of a healthy environment, including clean air and water and nutritious food, and explain why it is important for all living things to have a healthy environment
- 3.7** describe how the things plants and animals use to meet their needs are changed by their use and are returned to the environment in different forms (*e.g., the food animals eat and the water they drink are returned to the earth as scat and urine*)

UNDERSTANDING STRUCTURES AND MECHANISMS: MATERIALS, OBJECTS, AND EVERYDAY STRUCTURES

- 1** assess the impact on people and the environment of objects and structures and the materials used in them
- 1.1** identify the kinds of waste produced in the classroom, and plan and carry out a classroom course of action for minimizing waste, explaining why each action is important
- 1.2** assess objects in their environment that are constructed for similar purposes (*e.g., chairs at home and at school; different kinds of shoes; different kinds of floor coverings*) in terms of the type of materials they are made from, the source of these materials, and what happens to these objects when they are worn out or no longer needed

UNDERSTANDING MATTER AND ENERGY: ENERGY IN OUR LIVES

- 1** assess uses of energy at home, at school, and in the community, and suggest ways to use less energy
- 1.1** describe their own and their family's uses of energy (*e.g., to operate lights, video games, cars, computers*); identify ways in which these uses are efficient or wasteful, taking different points of view into consideration (*e.g., the point of view of a parent, a sibling, a member of their extended family*); suggest ways to reduce personal energy consumption; and explain why it is important for people to make these choices
- 1.2** describe how the everyday lives of different people and other living things would be affected if electrical energy were no longer available (*e.g., families, farmers, businesses and stores, a company that offers alternative energy sources such as solar-powered devices, the plants in a hydroponic greenhouse, the tropical animals in a Canadian zoo*)

Social Studies (2004)

HERITAGE AND CITIZENSHIP: RELATIONSHIPS, RULES, AND RESPONSIBILITIES

In the Heritage and Citizenship strand, students build a foundation for understanding citizenship. They begin by learning the importance of rules and responsibilities in their daily lives.

- describe how they follow the rules about respecting the rights and property of other people and about using the shared environment responsibly (*e.g., by sharing, being courteous, cooperating, not littering*)

CANADA AND WORLD CONNECTIONS: THE LOCAL COMMUNITY

- recognize that communities consist of various physical features and community facilities that meet human needs
- use a variety of resources and tools to gather, process, and communicate information about the distinguishing physical features and community facilities in their area
- describe how people in the community interact with each other and the physical environment to meet human needs

Health and Physical Education (1998)

HEALTHY LIVING

The Healthy Eating and Growth and Development components of the Healthy Living strand may lend themselves to aspects of environmental education inasmuch as they provide students with opportunities to use higher-order thinking skills.

Growth and Development

- identify the stages in development of humans (*e.g., comparing physical changes from birth to childhood*) and of other living things

ACTIVE PARTICIPATION

As students acquire living skills through physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally aware citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

Some ways in which elementary students can make connections with environmental education through the arts include:

- creating sculptures made of recycled and found materials;
- composing or accompanying music that reflects nature and/or human interaction with the natural environment;
- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy.

Language (2006)

Although no specific or overall expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts,

developing a point of view, and doing research. The example in the following expectation from the language document provides a context for environmental education.

WRITING

- 1.1 identify the topic, purpose, audience, and form for writing, initially with support and direction (e.g., . . . an “*All About the Seasons*” book for the class library; . . .)

Native Languages (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Learning about aspects of Native culture and communities may provide for students opportunities to make connections with local places.

French As a Second Language – French Immersion (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

GRADE 2

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: GROWTH AND CHANGES IN ANIMALS

- 1 assess ways in which animals have an impact on society and the environment, and ways in which humans have an impact upon animals and the places where they live
- 1.1 identify positive and negative impacts that animals have on humans (society) and the environment, form an opinion about one of them, and suggest ways in which the impact can be minimized or enhanced
- 1.2 identify positive and negative impacts that different kinds of human activity have on animals and where they live (*e.g., actions of animal lovers and groups that protect animals and their rights, the home owner who wants a nice lawn, people who visit zoos and wildlife parks, pet owners*), form an opinion about one of them, and suggest ways in which the impact can be minimized or enhanced
- 2 investigate similarities and differences in the characteristics of various animals
- 2.5 investigate the ways in which a variety of animals adapt to their environment and/or to changes in their environment, using various methods (*e.g., read simple non-fiction texts and Aboriginal stories; observe animal activity in the schoolyard and surrounding areas, and record findings*)
- 3.2 describe an adaptation as a characteristic body part, shape, or behaviour that helps a plant or animal survive in its environment (*e.g., some birds migrate to a warmer climate for the winter; the design of a whale's flipper allows the whale to turn, steer, and balance; the cecropia moth has the pattern of a snake's head on its wings: the hypothesis is that this is to frighten its predators away*)

UNDERSTANDING STRUCTURES AND MECHANISMS: MOVEMENT

- 1 assess the impact on society and the environment of simple machines and mechanisms
- 1.1 assess the impact on society and the environment of simple machines that allow movement

UNDERSTANDING MATTER AND ENERGY: PROPERTIES OF LIQUIDS AND SOLIDS

- 1 assess ways in which the uses of liquids and solids can have an impact on society and the environment
- 1.1 assess the ways in which liquids and solids in the home are used, stored, and disposed of in terms of the effect on personal safety and the health of the environment, and suggest responsible actions to replace inappropriate practices

UNDERSTANDING EARTH AND SPACE SYSTEMS: AIR AND WATER IN THE ENVIRONMENT

- 1** assess ways in which the actions of humans have an impact on the quality of air and water, and ways in which the quality of air and water has an impact on living things
 - 1.1** assess the impact of human activities on air and water in the environment, taking different points of view into consideration (*e.g., the point of view of parents, children, other community members*), and plan a course of action to help keep the air and water in the local community clean
 - 1.2** assess personal and family uses of water as responsible/efficient or wasteful, and create a plan to reduce the amount of water used, where possible
- 2** investigate the characteristics of air and water and the visible/invisible effects of and changes to air and/or water in the environment
- 2.5** investigate water in the natural environment (*e.g., observe and measure precipitation; observe and record cloud formations; observe water flow and describe where it goes; observe a puddle over time and record observations*)
- 3** demonstrate an understanding of the ways in which air and water are used by living things to help them meet their basic needs
 - 3.4** identify sources of water in the natural and built environment (*e.g., natural: oceans, lakes, ponds, streams, springs, water tables; human-made: wells, sewers, water-supply systems, reservoirs, water towers*)
 - 3.5** identify the three states of water in the environment, give examples of each (*e.g., solid – visible as ice, snow, sleet, hail, frost; liquid – visible as rain, dew; gas – visible as fog, water vapour*), and show how they fit into the water cycle when the temperature of the surrounding environment changes (*e.g., heat – evaporation; cooling – condensation and precipitation*)
 - 3.6** state reasons why clean water is an increasingly scarce resource in many parts of the world

Social Studies (2004)

Participation in United Nations celebrations (e.g., World Water Day, Earth Day, World Habitat Day, World Environment Day) can lead to an appreciation of the environment and can help students become engaged and environmentally literate citizens.

HERITAGE AND CITIZENSHIP: TRADITIONS AND CELEBRATIONS

- explain how the various cultures of individuals and groups contribute to the local community

CANADA AND WORLD CONNECTIONS: FEATURES OF COMMUNITIES AROUND THE WORLD

- explain how the environment affects people's lives and the ways in which their needs are met

Health and Physical Education (1998)

Depending on the level of students' understanding, it could be emphasized that local foods are friendlier to the environment than foods brought in from great distances. Such an emphasis fits well with the Grade 2 social studies topic Features of Communities Around the World.

HEALTHY LIVING

The Healthy Eating and Growth and Development components of the Healthy Living strand may lend themselves to aspects of environmental education inasmuch as they provide students with opportunities to use higher-order thinking skills.

Healthy Eating

- identify healthy eating practices and use a decision-making model to make healthy food choices

ACTIVE PARTICIPATION

As students acquire living skills through physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally literate citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

Some ways in which elementary students can make connections with environmental education through the arts include:

- creating sculptures made of recycled and found materials;
- composing or accompanying music that reflects nature and/or human interaction with the natural environment;
- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be

the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy.

DATA MANAGEMENT AND PROBABILITY

In one expectation in this strand, there is an example of mathematical language that students can use to describe a bar graph showing that more people walk to school than take the bus. The teacher could place such a bar graph in a broader environmental context.

Language (2006)

Although no specific or overall expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts, developing a point of view, and doing research. The examples in the following expectations from the language document provide a context for environmental education.

READING

1.4 demonstrate understanding of a text by retelling the story or restating information from the text, with the inclusion of a few interesting details (*e.g., . . . restate the important ideas from a short informational text about the life cycle of a butterfly in the correct sequence*)

MEDIA LITERACY

1.1 identify the purpose and intended audience of some simple media texts (*e.g., . . . this picture book of nature stories is aimed at children who are interested in animals*)

Native Languages (2001)

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French As a Second Language – French Immersion (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

GRADE 3

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: GROWTH AND CHANGES IN PLANTS

- 1** assess ways in which plants have an impact on society and the environment, and ways in which human activity has an impact on plants and plant habitats
- 1.2** assess the impact of different human activities on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects
- 2** investigate similarities and differences in the characteristics of various plants, and ways in which the characteristics of plants relate to the environment in which they grow
- 2.4** investigate ways in which a variety of plants adapt and/or react to their environment, including changes in their environment, using a variety of methods (*e.g., read a variety of non-fiction texts; interview plant experts; view DVDs or CD-ROMs*)
- 2.7** use a variety of forms (*e.g., oral, written, graphic, multimedia*) to communicate with different audiences and for a variety of purposes (*e.g., make illustrated entries in a personal science journal to describe plant characteristics and adaptations to harsh environments*)
- 3** demonstrate an understanding that plants grow and change and have distinct characteristics
- 3.2** identify the major parts of plants, including root, stem, flower, stamen, pistil, leaf, seed, and fruit, and describe how each contributes to the plant's survival within the plant's environment (*e.g., the roots soak up food and water for the plant; the stem carries water and food to the rest of the plant; the leaves make food for the plant with help from the sun; the flowers grow fruit and seeds for new plants*)
- 3.7** describe the different ways in which plants are grown for food (*e.g., on farms, in orchards, greenhouses, home gardens*), and explain the advantages and disadvantages of locally grown and organically produced food, including environmental benefits
- 3.8** identify examples of environmental conditions that may threaten plant and animal survival (*e.g., extreme heat and cold; floods and/or droughts; changes in habitat because of human activities such as construction, use of gas-powered personal watercraft on lakes*)

UNDERSTANDING STRUCTURES AND MECHANISMS: STRONG AND STABLE STRUCTURES

- 1** assess the importance of form, function, strength, and stability in structures through time
- 1.1** assess effects of strong and stable structures on society and the environment (*e.g., reliable load-bearing structures are essential in all areas of life for shelter, transportation, and many other everyday purposes; strong and stable structures can endure for long periods of time and provide a historical record of other societies and cultures; strong and stable structures can be hard to dispose of when their usefulness is ended and may then have a negative effect on the environment*)
- 1.2** assess the environmental impact of structures built by various animals and those built by humans

UNDERSTANDING MATTER AND ENERGY: FORCES CAUSING MOVEMENT

- 1** assess the impact of various forces on society and the environment
- 1.1** assess the effects of the action of forces in nature (natural phenomena) on the natural and built environment, and identify ways in which human activities can reduce or enhance this impact

UNDERSTANDING EARTH AND SPACE SYSTEMS: SOILS IN THE ENVIRONMENT

- 1** assess the impact of soils on society and the environment, and of society and the environment on soils
- 1.1** assess the impact of soils on society and the environment, and suggest ways in which humans can enhance positive effects and/or lessen or prevent harmful effects
- 1.2** assess the impact of human action on soils, and suggest ways in which humans can affect soils positively and/or lessen or prevent harmful effects on soils
- 2** investigate the composition and characteristics of different soils
- 2.2** investigate the components of soil (*e.g., non-living things such as pebbles and decaying matter; living things such as organic matter, bacteria, earthworms, and insects*), the condition of soil (*e.g., wet, dry*), and additives found in soil (*e.g., pesticides, fertilizers, salt*), using a variety of soil samples (*e.g., sand, clay, loam*) from different local environments, and explain how the different amounts of these components in a soil sample determine how the soil can be used
- 2.4** investigate the process of composting, and explain some advantages and disadvantages of composting (*e.g., set up a pop-bottle composter in the classroom, and observe what happens over time*)
- 3** demonstrate an understanding of the composition of soils, the types of soils, and the relationship between soils and other living things
- 3.1** identify and describe the different types of soils (*e.g., Sandy soil is made up of minerals and tiny pieces of rock that have come from the erosion and weathering of rocks. It feels gritty and does not stick together well. Sandy soil drains easily and quickly after a rain and warms up quickly in the spring, but does not hold water and nutrients as well as clay soil, and is eroded more easily. Loamy soil is made up of sand, silt, and clay in relatively equal amounts. It sticks together better than sand but not as well as clay. Loamy soil holds water and nutrients well, and also drains well so that sufficient air can reach the roots. Clay soil is a very fine-grained soil that is plastic when wet but hard when dried. It feels slick and smooth. Clay soils have poor drainage and aeration.*)
- 3.2** identify additives that might be in soil but that cannot always be seen (*e.g., pesticides, fertilizers, salt*)

Social Studies (2004)

HERITAGE AND CITIZENSHIP: EARLY SETTLEMENTS IN UPPER CANADA

- use a variety of resources and tools to gather, process, and communicate information about interactions between new settlers and existing communities, including First Nation peoples, and the impact of factors such as heritage, natural resources, and climate on the development of early settler communities

In connection with the following expectation, students may compare aspects of life within an environmental context.

- compare aspects of life in early settler communities and present-day communities

CANADA AND WORLD CONNECTIONS: URBAN AND RURAL COMMUNITIES

The specific expectations clarify the connections between the following overall expectations and environmental education.

- identify and compare distinguishing features of urban and rural communities
- use a variety of resources and tools to gather, process, and communicate geographic information about urban and rural communities
- explain how communities interact with each other and the environment to meet human needs

Health and Physical Education (1998)

HEALTHY LIVING

The first overall expectation, with its focus on healthy active living, may lend itself to environmental education as students connect healthy eating and living with a healthy environment.

ACTIVE PARTICIPATION

As students acquire living skills through physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally literate citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

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- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy.

DATA MANAGEMENT AND PROBABILITY

In this strand, the collecting of data could be extended to include environmental issues.

Language (2006)

In each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts, developing a point of view, and doing research.

In the Reading strand, expectation 2.1 explicitly provides a context for environmental education, and some examples or teacher prompts in the rest of the following expectations also explicitly provide a context for environmental education.

ORAL COMMUNICATION

- 2.7** use a variety of appropriate visual aids (*e.g., overheads, diagrams, graphic organizers, charts, artefacts*) to support or enhance oral presentations (*e.g., use a large-size labelled diagram to illustrate an explanation of how soil erodes*)

READING

- 1.5** make inferences about texts using stated and implied ideas from the texts as evidence
Teacher prompts: . . . “Why do you think early settlers chose wood to build their homes? Is there any evidence in the text to explain this?”

READING (cont.)

- 1.6** extend understanding of texts by connecting the ideas in them to their own knowledge and experience, to other familiar texts, and to the world around them
Teacher prompts: . . . “Do you know of other reasons why trees are important besides the reasons mentioned in the book?”
- 2.1** identify and describe the characteristics of a variety of text forms, with a focus on literary texts such as a fable or adventure story (*e.g., plot development, characters, setting*), graphic texts such as a comic book (*e.g., speech bubbles, illustrations, captions*), and informational texts such as a nature magazine (*e.g., table of contents, diagrams, photographs, labels, captions*)

WRITING

- 2.1** write short texts using a variety of forms (*e.g., a personal or factual recount of events or experiences that includes photographs or drawings and captions; a report comparing transportation in urban and rural communities; a paragraph explaining how physical geography and natural resources affected the development of early settler communities; a letter from the point of view of a settler, describing how First Nations people have taught the settlers to adapt to their new environment; a familiar story told from a new perspective; a patterned poem using rhyme or repetition*)

MEDIA LITERACY

- 1.3** express personal opinions about ideas presented in media texts (*e.g., respond to the messages in a public service announcement about recycling; . . .*)

Native Languages (2001)

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French As a Second Language – French Immersion (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

GRADE 4

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: HABITATS AND COMMUNITIES

- 1** analyse the effects of human activities on habitats and communities
- 1.1** analyse the positive and negative impacts of human interactions with natural habitats and communities (*e.g., human dependence on natural materials*), taking different perspectives into account (*e.g., the perspectives of a housing developer, a family in need of housing, an ecologist*), and evaluate ways of minimizing the negative impacts
- 1.2** identify reasons for the depletion or extinction of a plant or animal species (*e.g., hunting, disease, invasive species, changes in or destruction of its habitat*), evaluate the impacts on the rest of the natural community, and propose possible actions for preventing such depletions or extinctions from happening
- 3** demonstrate an understanding of habitats and communities and the relationships among the plants and animals that live in them
- 3.1** demonstrate an understanding of habitats as areas that provide plants and animals with the necessities of life (*e.g., food, water, air, space, and light*)
- 3.8** explain why changes in the environment have a greater impact on specialized species than on generalized species (*e.g., diminishing ice cover hampers the ability of polar bears to hunt seals, their main food source, and so the polar bear population in some areas is becoming less healthy and may begin to decrease; black bear habitat has been heavily disrupted by human encroachment, but because black bears are highly adaptable omnivores that eat everything from insects to garbage generated by humans, their numbers have been increasing*)
- 3.10** describe ways in which humans are dependent on natural habitats and communities (*e.g., for water, medicine, flood control in wetlands, leisure activities*)

UNDERSTANDING STRUCTURES AND MECHANISMS: PULLEYS AND GEARS

- 1.2** assess the environmental impact of using machines with pulleys and gears, taking different perspectives into account (*e.g., the perspectives of a car driver or cyclist, someone who is physically challenged, the owner of a multifloor building*), and suggest ways to minimize negative impacts and maximize positive impacts

UNDERSTANDING MATTER AND ENERGY: LIGHT AND SOUND

- 1** assess the impact on society and the environment of technological innovations related to light and sound
- 1.2** assess the impacts on society and the environment of light and/or sound energy produced by different technologies, taking different perspectives into account (*e.g., the perspectives of someone who has to walk on the street late at night, a cottage owner, a person who is hearing impaired, manufacturers of and merchants who sell MP3 players*)

UNDERSTANDING EARTH AND SPACE SYSTEMS: ROCKS AND MINERALS

- 1** assess the social and environmental impacts of human uses of rocks and minerals
- 1.1** assess the social and environmental costs and benefits of using objects in the built environment that are made from rocks and minerals
- 1.2** analyse the impact on society and the environment of extracting and refining rocks and minerals for human use, taking different perspectives into account (*e.g., the perspectives of mine owners, the families of the miners, Aboriginal communities, the refinery workers, manufacturers of items who need the refined rocks and minerals to make their products, residents who live in communities located near refineries and manufacturing facilities and who are concerned about the environment*)

Social Studies (2004)

HERITAGE AND CITIZENSHIP: MEDIEVAL TIMES

The specific expectations related to the following overall expectation clarify the connection between the expectation and environmental education: students learn about the dependence of human systems on natural systems within a historical context.

- relate significant elements of medieval societies to comparable aspects of contemporary Canadian communities

CANADA AND WORLD CONNECTIONS: CANADA'S PROVINCES, TERRITORIES, AND REGIONS

The specific expectations in this strand clarify the connection between the strand and environmental education: students learn how natural systems influence human systems and activities, including cultural activities.

- name and locate the various physical regions, provinces, and territories of Canada and identify the chief natural resources of each
- use a variety of resources and tools to determine the influence of physical factors on the economies and cultures of Ontario and the other provinces and territories
- identify, analyse, and describe economic and cultural relationships that link communities and regions within Ontario and across Canada

Health and Physical Education (1998)

HEALTHY LIVING

The first overall expectation, with its focus on healthy eating practices, may lend itself to environmental education as students determine whether their food choices are healthy and how healthy food choices relate to the environment.

ACTIVE PARTICIPATION

As students apply living skills to physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally literate citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

Some ways in which elementary students can make connections with environmental education through the arts include:

- creating sculptures made of recycled and found materials;
- composing or accompanying music that reflects nature and/or human interaction with the natural environment;
- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy.

DATA MANAGEMENT AND PROBABILITY

In this strand, the collecting of data could be extended to include environmental issues.

Language (2006)

Although no specific or overall expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts,

developing a point of view, and doing research. Some examples in the following expectations from the language document provide a context for environmental education.

WRITING

- 2.1** write more complex texts using a variety of forms (*e.g., . . . a report, including jot notes, comparing the environments of two or more regions in Canada; . . .*)

MEDIA LITERACY

- 1.3** express opinions about ideas, issues, and/or experiences presented in media texts, and give evidence from the texts to support their opinions (*e.g., “I think this documentary about lions is one-sided because it only shows them as predators”; . . .*)
- 2.1** identify elements and characteristics of some media forms (*e.g., . . . a television nature program: outdoor setting, wildlife “actors”, voice-over narration, background music; . . .*)

Native Languages (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Learning about aspects of Native culture and communities may provide for students opportunities to make connections with local places.

French As a Second Language – Extended French, French Immersion (2001); Core French (1998)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

GRADE 5

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: HUMAN ORGAN SYSTEMS

- 1 analyse the impact of human activities and technological innovations on human health
- 1.1 assess the effects of social and environmental factors on human health, and propose ways in which individuals can reduce the harmful effects of these factors and take advantage of those that are beneficial

UNDERSTANDING STRUCTURES AND MECHANISMS: FORCES ACTING ON STRUCTURES AND MECHANISMS

- 1 analyse social and environmental impacts of forces acting on structures and mechanisms
- 1.1 analyse the effects of forces from natural phenomena (*e.g., tornadoes, hurricanes, earthquakes, tsunamis*) on the natural and built environment
- 1.2 evaluate the impact of society and the environment on structures and mechanisms, taking different perspectives into account (*e.g., the perspectives of golfers, local bird-watching groups, families, a school board*), and suggest ways in which structures and mechanisms can be modified to best achieve social and environmental objectives
- 3 identify forces that act on and within structures and mechanisms, and describe the effects of these forces on structures and mechanisms
- 3.4 describe forces resulting from natural phenomena that can have severe consequences for structures in the environment (*e.g., a house loses its roof in a wind storm*), and identify structural features that help overcome some of these forces (*e.g., cross supports for roofs, steel beams in bridges*)

UNDERSTANDING MATTER AND ENERGY: PROPERTIES OF AND CHANGES IN MATTER

- 1 evaluate the social and environmental impacts of processes used to make everyday products
- 1.1 evaluate the environmental impacts of processes that change one product into another product through physical or chemical changes
- 1.2 assess the social and environmental impact of using processes that rely on chemical changes to produce consumer products, taking different perspectives into account (*e.g., the perspectives of food manufacturers, consumers, landfill operators, people concerned about the environment*), and make a case for maintaining the current level of use of the product or for reducing it

UNDERSTANDING EARTH AND SPACE SYSTEMS: CONSERVATION OF ENERGY AND RESOURCES

- 1** analyse the immediate and long-term effects of energy and resource use on society and the environment, and evaluate options for conserving energy and resources
- 1.1** analyse the long-term impacts on society and the environment of human uses of energy and natural resources, and suggest ways to reduce these impacts (*e.g., turning off the faucet while brushing teeth or washing and rinsing dishes conserves water; reusing or recycling products, or using fewer products, conserves natural resources and energy*)
- 1.2** evaluate the effects of various technologies on energy consumption (*e.g., improving our home's insulation allows us to conserve heat and reduce energy consumption; aerodynamic design can improve the energy efficiency of cars and buses; household appliances designed to make our lives easier use large amounts of energy; some cars and recreational vehicles use energy less efficiently than others*), and propose ways in which individuals can improve energy conservation
- 3** demonstrate an understanding of the various forms and sources of energy and the ways in which energy can be transformed and conserved
- 3.2** identify renewable and non-renewable sources of energy (*e.g., renewable: sun, wind, ocean waves and tides, wood; non-renewable: fossil fuels such as coal and natural gas*)

Social Studies (2004)

HERITAGE AND CITIZENSHIP: EARLY CIVILIZATIONS

The following overall expectations, and their related specific expectations, provide students with opportunities to develop an understanding of interactions between humans and the environment in early civilizations (including the role of technology) and an understanding of the relevance to the modern world of elements and discoveries from these civilizations.

- identify and compare the ways in which people in various early civilizations met their physical and social needs, including how they interacted with and used the natural environment
- use a variety of resources and tools to investigate characteristics of a number of early civilizations, including their significant innovations and technological advances
- show how innovations made by various early civilizations have influenced the modern world

CANADA AND WORLD CONNECTIONS: ASPECTS OF CITIZENSHIP AND GOVERNMENT IN CANADA

The following overall expectations, and their related specific expectations, provide students with opportunities to develop the knowledge and skills required for the informed, responsible, and active citizenship that is an essential part of being environmentally literate.

- use a variety of resources and tools to gather and analyse information about government processes, the rights of groups and individuals, and the responsibilities of citizenship in Canada, including participation in the electoral process
- identify concrete examples of how government plays a role in contemporary society and of how the rights of groups and individuals and the responsibilities of citizenship apply to their own lives

Health and Physical Education (1998)

HEALTHY LIVING

The first overall expectation, with its focus on healthy eating practices, may lend itself to environmental education as students analyse information about foods (including information from package labels) and consider the relationship between healthy foods and the environment.

ACTIVE PARTICIPATION

As students apply living skills to physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally literate citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

Some ways in which elementary students can make connections with environmental education through the arts include:

- creating sculptures made of recycled and found materials;
- composing or accompanying music that reflects nature and/or human interaction with the natural environment;
- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

VISUAL ARTS

There is mention of the environment in the example from the following expectation in the Visual Arts strand.

Creative Work

- identify, in their plan for a work of art, the artistic problem and a number of possible solutions (e.g., identify different types of subject matter that they could use to express their concern for the environment)

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy.

DATA MANAGEMENT AND PROBABILITY

In this strand, the collecting of data could be extended to include environmental issues.

Language (2006)

Although no specific or overall expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts, developing a point of view, and doing research. Some examples in the expectations for the Writing and Media Literacy strands support environmental literacy skill development.

Native Languages (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Learning about aspects of Native culture and communities may provide for students opportunities to make connections with local places.

French As a Second Language – Extended French, French Immersion (2001); Core French (1998)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

GRADE 6

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: BIODIVERSITY

- 1 assess human impacts on biodiversity, and identify ways of preserving biodiversity
- 1.1 analyse a local issue related to biodiversity (*e.g., the effects of human activities on urban biodiversity, flooding of traditional Aboriginal hunting and gathering areas as a result of dam construction*), taking different points of view into consideration (*e.g., the points of view of members of the local community, business owners, people concerned about the environment, mine owners, local First Nations, Métis, Inuit*), propose action that can be taken to preserve biodiversity, and act on the proposal
- 1.2 assess the benefits that human societies derive from biodiversity (*e.g., thousands of products such as food, clothing, medicine, and building materials come from plants and animals*) and the problems that occur when biodiversity is diminished (*e.g., monocultures are more vulnerable to pests and diseases*)
- 2 investigate the characteristics of living things, and classify diverse organisms according to specific characteristics
- 3.2 demonstrate an understanding of biodiversity as the variety of life on earth, including variety within each species of plant and animal, among species of plants and animals in communities, and among communities and the physical landscapes that support them
- 3.7 explain how invasive species (*e.g., zebra mussel, Asian longhorned beetle, purple loosestrife*) reduce biodiversity in local environments

UNDERSTANDING STRUCTURES AND MECHANISMS: FLIGHT

- 1 assess the societal and environmental impacts of flying devices that make use of properties of air
- 1.1 assess the benefits and costs of aviation technology for society and the environment, taking different social and economic perspectives into account (*e.g., the perspectives of farmers, airline workers, doctors, home owners, tour operators*)

UNDERSTANDING MATTER AND ENERGY: ELECTRICITY AND ELECTRICAL DEVICES

- 1 evaluate the impact of the use of electricity on both the way we live and the environment
- 1.1 assess the short- and long-term environmental effects of the different ways in which electricity is generated in Canada (*e.g., hydro, thermal, nuclear, wind, solar*), including the effect of each method on natural resources and living things in the environment
- 1.2 assess opportunities for reducing electricity consumption at home or at school that could affect the use of non-renewable resources in a positive way or reduce the impact of electricity generation on the environment

UNDERSTANDING EARTH AND SPACE SYSTEMS: SPACE

- 1** assess the impact of space exploration on society and the environment
- 1.2** evaluate the social and environmental costs and benefits of space exploration, taking different points of view into account (*e.g., the point of view of health care workers and workers in other agencies that compete with space programs for public money; astronauts and their families; the general public; scientists*)

Social Studies (2004)

HERITAGE AND CITIZENSHIP: FIRST NATION PEOPLES AND EUROPEAN EXPLORERS

- describe characteristics of pre-contact First Nation cultures across Canada, including their close relationships with the natural environment; the motivations and attitudes of the European explorers; and the effects of contact on both the receiving and the incoming groups

CANADA AND WORLD CONNECTIONS: CANADA'S LINKS TO THE WORLD

The following overall expectation supports the study of environmental issues from a global perspective.

- explain the relevance to Canada of current global issues and influences

Health and Physical Education (1998)

ACTIVE PARTICIPATION

As students apply living skills in physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally literate citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

Some ways in which elementary students can make connections with environmental education through the arts include:

- creating sculptures made of recycled and found materials;
- composing or accompanying music that reflects nature and/or human interaction with the natural environment;
- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy.

DATA MANAGEMENT AND PROBABILITY

In this strand, the collecting of data could be extended to include environmental issues.

Language (2006)

Although no specific or overall expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts, developing a point of view, and doing research. No examples in the language document explicitly provide a context for environmental education.

Native Languages (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Learning about aspects of Native culture and communities may provide for students opportunities to make connections with local places.

The example in the following expectation from the Reading strand provides a good opportunity for environmental education and connects with the Heritage and Citizenship strand in the social studies curriculum.

READING

- read a variety of simple written texts (e.g., traditional Native stories and legends, short stories by Native authors)

French As a Second Language – Extended French, French Immersion (2001); Core French (1998)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

GRADE 7

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: INTERACTIONS IN THE ENVIRONMENT

- 1** assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts
 - 1.1** assess the impact of selected technologies on the environment
 - 1.2** analyse the costs and benefits of selected strategies for protecting the environment
- 2** investigate interactions within the environment, and identify factors that affect the balance between different components of an ecosystem
 - 2.2** design and construct a model ecosystem (*e.g., a composter, a classroom terrarium, a greenhouse*), and use it to investigate interactions between the biotic and abiotic components in an ecosystem
- 3** demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment
 - 3.1** demonstrate an understanding of an ecosystem (*e.g., a log, a pond, a forest*) as a system of interactions between living organisms and their environment
 - 3.2** identify biotic and abiotic elements in an ecosystem, and describe the interactions between them (*e.g., between hours of sunlight and the growth of plants in a pond; between a termite colony and a decaying log; between the soil, plants, and animals in a forest*)
 - 3.3** describe the roles and interactions of producers, consumers, and decomposers within an ecosystem (*e.g., Plants are producers in ponds. They take energy from the sun and produce food, oxygen, and shelter for the other pond life. Black bears are consumers in forests. They eat fruits, berries, and other consumers. By eating other consumers, they help to keep a balance in the forest community. Bacteria and fungi are decomposers. They help to maintain healthy soil by breaking down organic materials such as manure, bone, spider silk, and bark. Earthworms then ingest the decaying matter, take needed nutrients from it, and return those nutrients to the soil through their castings.*)
 - 3.5** describe how matter is cycled within the environment and explain how it promotes sustainability (*e.g., bears carry salmon into the forest, where the remains decompose and add nutrients to the soil, thus supporting plant growth; through crop rotation, nutrients for future crops are created from the decomposition of the waste matter of previous crops*)
 - 3.7** explain why an ecosystem is limited in the number of living things (*e.g., plants and animals, including humans*) that it can support
 - 3.8** describe ways in which human activities and technologies alter balances and interactions in the environment (*e.g., clear-cutting a forest, overusing motorized water vehicles, managing wolf-killings in Yukon*)
 - 3.9** describe Aboriginal perspectives on sustainability and describe ways in which they can be used in habitat and wildlife management (*e.g., the partnership between the Anishinabek Nation and the Ministry of Natural Resources for managing natural resources in Ontario*)

UNDERSTANDING STRUCTURES AND MECHANISMS: FORM AND FUNCTION

- 1** analyse personal, social, economic, and environmental factors that need to be considered in designing and building structures and devices
- 1.1** evaluate the importance for individuals, society, the economy, and the environment of factors that should be considered in designing and building structures and devices to meet specific needs (*e.g., function; efficiency; ease of use; user preferences; aesthetics; cost; intended lifespan; effect on the environment; safety, health, legal requirements*)

UNDERSTANDING MATTER AND ENERGY: PURE SUBSTANCES AND MIXTURES

- 1** evaluate the social and environmental impacts of the use and disposal of pure substances and mixtures
- 1.1** assess positive and negative environmental impacts related to the disposal of pure substances (*e.g., uranium*) and mixtures (*e.g., paint, sewage*)
- 1.2** assess the impact on society and the environment of different industrial methods of separating mixtures and solutions

UNDERSTANDING EARTH AND SPACE SYSTEMS: HEAT IN THE ENVIRONMENT

- 1** assess the costs and benefits of technologies that reduce heat loss or heat-related impacts on the environment
- 1.1** assess the social and environmental benefits of technologies that reduce heat loss or transfer (*e.g., insulated clothing, building insulation, green roofs, energy-efficient buildings*)
- 1.2** assess the environmental and economic impacts of using conventional (*e.g., fossil fuel, nuclear*) and alternative forms of energy (*e.g., geothermal, solar, wind, wave, biofuel*)
- 3** demonstrate an understanding of heat as a form of energy that is associated with the movement of particles and is essential to many processes within the earth's systems
- 3.7** describe the role of radiation in heating and cooling the earth, and explain how greenhouse gases affect the transmission of radiated heat through the atmosphere (*e.g., The earth is warmed by absorbing radiation from the sun. It cools by radiating thermal energy back to space. Greenhouse gases absorb some of the radiation that the earth emits to space and reradiate it back to the earth's surface. If the quantity of greenhouse gases in the atmosphere increases, they absorb more outgoing radiation, and the earth becomes warmer.*)
- 3.8** identify common sources of greenhouse gases (*e.g., carbon dioxide comes from plant and animal respiration and the burning of fossil fuels; methane comes from wetlands, grazing livestock, termites, fossil fuel extraction, and landfills; nitrous oxide comes from soils and nitrogen fertilizers*), and describe ways of reducing emissions of these gases

History and Geography (2004)

HISTORY

New France

The following overall expectation in the History strand addresses the interactions between humans and the environment within a historical context.

- use a variety of resources and tools to gather, process, and communicate information about how settlers in New France met the physical, social, and economic challenges of the new land

GEOGRAPHY

The Themes of Geographic Inquiry

- identify and explain the themes of geographic inquiry: location/place, environment, region, interaction, and movement
- analyse current environmental issues or events from the perspective of one or more of the themes of geographic inquiry

The following overall expectation provides students with opportunities to develop the skills of environmentally literate citizens (e.g., inquiry, higher-level thinking, futures thinking, and communication) in an environmental context.

- use a variety of geographic resources and tools to gather, process, and communicate geographic information

Patterns in Physical Geography

- explain how patterns of physical geography affect human activity around the world

The following overall expectation provides students with opportunities to develop the skills of environmentally literate citizens (e.g., inquiry, higher-level thinking, futures thinking, and communication) in an environmental context.

- use a variety of resources and tools to gather, process, and communicate geographic information about the earth's physical features and patterns

Natural Resources

- describe how humans acquire, manage, and use natural resources, and identify factors that affect the importance of those resources
- use a variety of resources and tools to gather, process, and communicate geographic information about the distribution, use, and importance of natural resources
- describe positive and negative ways in which human activity can affect resource sustainability and the health of the environment

Health and Physical Education (1998)

ACTIVE PARTICIPATION

As students apply living skills in physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally literate citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

Some ways in which elementary students can make connections with environmental education through the arts include:

- creating sculptures made of recycled and found materials;
- composing or accompanying music that reflects nature and/or human interaction with the natural environment;
- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

VISUAL ARTS

In the example in the following expectation from the Visual Arts strand, there is reference to a strong relationship between the artist and the natural environment.

Critical Thinking

- explain their preference for specific art works, with reference to the artist's intentional use of the elements and principles of design (e.g., the smooth texture and balanced forms of Inuit soapstone carvings effectively communicate the artists' harmonious relationship with the natural world)

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy.

DATA MANAGEMENT AND PROBABILITY

In this strand, the collecting and analysing of data could be extended to include environmental issues.

Language (2006)

Although no specific or overall expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) can be used to foster in students the development of environmental understanding, with a focus on critical literacy. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts, developing a point of view, and doing research. Critical literacy involves the capacity for analysing texts and challenging their underlying messages, demonstrating self-criticism, and remaining open to further insights into the text. The example in the following expectation from the language document provides a context for environmental education.

WRITING

- 1.1** identify the topic, purpose, and audience for more complex writing forms (*e.g., . . . a report for a community newspaper about a public meeting on an environmental issue affecting local neighbourhoods; . . .*)

Native Languages (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Learning about aspects of Native culture and communities may provide for students opportunities to make connections with local places.

French As a Second Language – Extended French, French Immersion (2001); Core French (1998)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

GRADE 8

See the Preface for important information on the organization of the following material.

Science and Technology (2007)

UNDERSTANDING LIFE SYSTEMS: CELLS

- 1 assess the impact of cell biology on individuals, society, and the environment
- 1.2 assess the potential that our understanding of cells and cell processes has for both beneficial and harmful effects on human health and the environment, taking different perspectives into account (*e.g., the perspectives of farmers, pesticide manufacturers, people with life-threatening illnesses*)

UNDERSTANDING STRUCTURES AND MECHANISMS: SYSTEMS IN ACTION

- 1 assess the personal, social, and/or environmental impacts of a system, and evaluate improvements to a system and/or alternative ways of meeting the same needs
 - 1.1 assess the social, economic, and environmental impacts of automating systems
 - 1.2 assess the impact on individuals, society, and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration
- 3 demonstrate an understanding of different types of systems and the factors that contribute to their safe and efficient operation
- 3.9 identify social factors that influence the evolution of a system (*e.g., growing concern over the amount of waste creates a need for recycling centres, and the recycling centres must grow as population and waste increase; the desire to make tasks easier creates a need for pulley systems, gear systems, and hydraulic and pneumatic systems; changes in traditional work hours created by technological advances can influence changes in a child care system*)

UNDERSTANDING MATTER AND ENERGY: FLUIDS

- 1 analyse how the properties of fluids are used in various technologies, and assess the impact of these technologies on society and the environment
 - 1.1 assess the social, economic, and environmental impacts of selected technologies that are based on the properties of fluids
 - 1.2 assess the impact of fluid spills on society and the environment, including the cost of the cleanup and the effort involved

UNDERSTANDING EARTH AND SPACE SYSTEMS: WATER SYSTEMS

- 1 assess the impact of human activities and technologies on the sustainability of water resources
 - 1.1 evaluate personal water consumption, compare it with personal water consumption in other countries, and propose a plan of action to reduce personal water consumption to help address water sustainability issues

UNDERSTANDING EARTH AND SPACE SYSTEMS: WATER SYSTEMS (cont.)

- 1.2** assess how various media sources (*e.g., Canadian Geographic; the science section in newspapers; Internet websites; local, national, and international news on television and radio*) address issues related to the impact of human activities on the long-term sustainability of local, national, or international water systems
- 1.3** assess the impact on local and global water systems of a scientific discovery or technological innovation (*e.g., enhancing the efficiency of naturally occurring bacteria that consume hydrocarbons from oil spills and convert them to carbon dioxide and water; development of desalination techniques to provide fresh water from sea water*)
- 3** demonstrate an understanding of the characteristics of the earth's water systems and the influence of water systems on a specific region
- 3.3** explain how human and natural factors cause changes in the water table (*e.g., lawn watering, inefficient showers and toilets, drought, floods, overuse of wells, extraction by bottled water industry*)
- 3.4** identify factors (*e.g., annual precipitation, temperature, climate change*) that affect the size of glaciers and polar ice-caps, and describe the effects of these changes on local and global water systems

History and Geography (2004)

HISTORY

Confederation, The Development of Western Canada, and Canada: A Changing Society

The third overall expectation in each history topic, along with some specific expectations (especially under the Application subheading), addresses how humans interact with the environment (*e.g., socially and economically*) within a historical context.

GEOGRAPHY

Patterns in Human Geography

The following two overall expectations, with support from their specific expectations, address the ways in which humans take the natural environment into account in determining human settlement and land use and in planning for the future, and ways in which humans change the natural environment.

- identify the main patterns of human settlement and identify the factors that influence population distribution and land use
- compare living and working conditions in countries with different patterns of settlement, and examine how demographic factors could affect their own lives in the future

The following overall expectation provides students with opportunities to develop the skills of environmentally literate citizens (*e.g., inquiry, higher-level thinking, futures thinking, and communication*) in an environmental context.

- use a variety of geographic representations, resources, tools, and technologies to gather, process, and communicate geographic information about patterns in human geography

Economic Systems

The following two overall expectations, with support from their specific expectations, address the ways in which humans and the natural environment are interdependent, including ways in which technology has changed human interaction with the natural environment.

- describe the characteristics of different types of economic systems and the factors that influence them, including economic relationships and levels of industrial development
- compare the economies of different communities, regions, or countries, including the influence of factors such as industries, access to resources, and access to markets

The following overall expectation provides students with opportunities to develop the skills of environmentally literate citizens (e.g., inquiry, higher-level thinking, futures thinking, and communication) in an environmental context.

- use a variety of geographic representations, resources, tools, and technologies to gather, process, and communicate geographic information about regional, national, and international economic systems

Migration

Environmental factors, both human and natural (e.g., climate, economic potential, communication and transportation systems) influence migration. Another factor that needs to be considered is the natural capacity of a settlement to support its residents.

- identify factors that affect migration and mobility, describe patterns and trends of migration in Canada, and identify the effects of migration on Canadian society

Health and Physical Education (1998)

HEALTHY LIVING

The first overall expectation, with its focus on healthy eating practices, may lend itself to environmental education as students consider adopting a food plan that includes environmentally friendly food choices (e.g., locally grown food with minimal packaging).

ACTIVE PARTICIPATION

As students apply living skills in physical activities (third overall expectation), they can develop an appreciation of the natural environment, gain an experiential knowledge of the environment, and develop the problem-solving skills necessary for an environmentally literate citizen.

The Arts (1998)

Although no overall or specific expectations explicitly address environmental education, in each strand of the arts curriculum the learning context and/or learning materials could be used to foster in students the development of environmental understanding. Through music, the visual arts, drama, and dance, students can represent their thoughts, feelings, and ideas about the environment and their understandings of issues related to the environment.

Some ways in which elementary students can make connections with environmental education through the arts include:

- creating sculptures made of recycled and found materials;
- composing or accompanying music that reflects nature and/or human interaction with the natural environment;
- performing site-specific dance works that integrate the natural environment in which they are performed;
- dramatizing legends, stories, or tales about the environment.

Mathematics (2005)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context could be used to foster in students the development of environmental understanding (e.g., problems relating to climate or waste management could be the focus of student learning). In addition, the mathematical processes (e.g., problem solving, connecting) address skills that can be used to support the development of environmental literacy. The sample problem in the following specific expectation from the Data Management and Probability strand explicitly provides a context for environmental education.

DATA MANAGEMENT AND PROBABILITY

- make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs (*Sample problem:* Use data to make a convincing argument that the environment is becoming increasingly polluted.)

Language (2006)

Although no specific or overall expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) can be used to foster in students the development of environmental understanding, with a focus on critical literacy. Also, in each of the strands, there are some expectations that can provide opportunities for exploring environmental education – for example, expectations on making inferences, making connections, analysing and evaluating texts, developing a point of view, and doing research. Critical literacy involves the capacity for analysing texts and challenging their underlying messages, demonstrating self-criticism, and remaining open to further insights into the text.

The examples in the following expectations from the language document provide a context for environmental education.

ORAL COMMUNICATION

- 1.1** identify a range of purposes for listening in a variety of situations, formal and informal, and set goals appropriate to specific listening tasks (*e.g., to evaluate the effectiveness of the arguments on both sides of a class debate on an environmental, social, or global issue; ...*)
- 1.7** analyse a variety of complex or challenging oral texts in order to identify the strategies that have been used to inform, persuade, or entertain, and evaluate the effectiveness of those strategies (*e.g., compare the tone and the ideas emphasized in speeches about non-smoking regulations by a tobacco company representative and a person with asthma and suggest how each approach would influence an audience*)

READING

- 1.9** identify the point of view presented in texts, including increasingly complex or difficult texts; give evidence of any biases they may contain; and suggest other possible perspectives (*e.g., determine whether an environmental argument should include an economic perspective or an economic argument should include an environmental perspective*)

WRITING

- 2.1** write complex texts of a variety of lengths using a wide range of forms (*e.g., . . . a report comparing the economies of two nations and explaining how a new industry might affect each nation's economy; . . .*)

MEDIA LITERACY

- 1.3** evaluate the effectiveness of the presentation and treatment of ideas, information, themes, opinions, issues, and/or experiences in media texts (*e.g., . . . as a class, evaluate the media's coverage of a social or environmental issue over a two-week period*)

Native Languages (2001)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding. Learning about aspects of Native culture and communities may provide for students opportunities to make connections with local places. An example in the following expectation in the Writing strand provides an opportunity for environmental education.

WRITING

- write for a variety of purposes using different forms (e.g., . . . write a story to illustrate how Native people view the relationship between humans and the land)

French As a Second Language – Extended French, French Immersion (2001); Core French (1998)

Although no overall or specific expectations explicitly address environmental education, in each of the strands the learning context (e.g., a topic or thematic unit related to the environment) and/or learning materials (e.g., books, websites, media) could be used to foster in students the development of environmental understanding.

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