



National Parks' Challenges Lesson Plan: Curriculum Connections

Alberta

Curriculum Connections for Alberta

Grade 9, Geography: Economic Growth, Different Perspectives

- *Draw conclusions about technological change and its effect on quality of life.
- *Determine the values underlying a position (identify, define, describe value priorities, value conflicts).
- *Identify and evaluate alternative answers, conclusions, solutions or decisions regarding questions and issues used for inquiry and research on responding to change.

Grade 9, Science

*Focusing Questions:

What is biological diversity?

What impact does human activity have on biological diversity?

- *Investigate and interpret diversity among species and within species, and describe how diversity contributes to species survival.
- *Investigate and interpret dependencies among species that link the survival of one species to the survival of others.
- *Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making.
- *Describe ongoing changes in biological diversity through extinction and extirpation of native species, and investigate the role of environmental factors in causing these changes.
- *Evaluate the success and limitations of various local and global strategies for minimizing loss of species diversity.

Grade 9, Science: Unit A, Biological Diversity

- *Students will be encouraged to demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment.
- *Investigate and interpret diversity among species and within species, and describe how diversity contributes to species survival.
- *Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making.
- *Describe ongoing changes in biological diversity through extinction and extirpation of native species, and investigate the role of environmental factors in causing these changes.
- *Investigate effects of changing land use.
- *Investigate various local and global strategies for minimizing loss of species diversity.

Grade 9, Science: Unit C, Environmental Chemistry

- *Illustrate the use of biological monitoring.

*Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds.

*Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment.

Grade 10, Science: Unit D

*Students will be encouraged to demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment.

Grade 10, Science: Unit D, Investigating Matter and Energy in the Environment

*How is human activity influencing the natural flow of matter and energy in the biosphere? Should humans as a species be concerned about the effects of their activities on other species and the environment?

*Biotic and abiotic factors and ecosystems.

*Human impact on ecosystems.

*Identify and assess the needs and interests of society that have led to technologies with unforeseen environmental consequences.

*Analyze a local ecosystem in terms of its biotic and abiotic components, and describe factors of the equilibrium.

*Describe, in general terms, the characteristics of two Alberta biomes.

*Define ecosystems in terms of biotic and abiotic factors.

*Describe how various abiotic factors influence biodiversity in an ecosystem.

*Explain how biotic relationships can be explained in terms of the movement of matter and energy, using food chains, food webs and energy pyramids.

*Explain how various factors influence the size of populations; i.e., immigration and emigration, birth and death rates, food supply, predation, disease, reproductive rate, number of offspring produced, and climate change.

*Describe how interactions among organisms limit populations (e.g., predation, parasitism, competition).

*Assess the impact of the introduction of exotic species on a specific ecosystem or biome.

*Describe the relationship between land use practices and altering ecosystems.

*Trace the development of a technological application that has altered an ecosystem.

Grade 11, Biology: Unit 1, The Biosphere

*Research the ability and responsibility of society, through science and technology, to protect the environment and use natural resources judiciously to ensure quality of life for future generations.

*Appreciate the complexity of our planet.

*Develop an awareness of one's personal role in the preservation of the environment.

*Develop a sense of responsibility toward use of our environment.

*Develop optimism about humankind's ability to learn to function within the limits of sustainable development.

*Develop an open-mindedness concerning the views and values of others.

*Develop an attitude of participation in planning and shaping the future.

Grade 11, Biology: Unit 3, Energy and Matter Exchange in Ecosystems

- *The ability and responsibility of society, through science and technology, to protect the environment and use natural resources judiciously to ensure quality of life for future generations.
- *Appreciate the diversity of ecosystems.
- *Value the knowledge that all organisms have an important role in maintaining the life of the planet.
- *Develop an awareness of one's personal role in the preservation of the environment.
- *Develop a sense of responsibility toward use of the environment.
- *Appreciate the multidimensional nature of scientific, technological and societal issues.
- *Appreciate the contributions and limitations of scientific and technological knowledge to societal decision making.
- *Respect and tolerate the personal and religious beliefs of others.

Grade 11, Science: Unit B, Changes in Living Systems

- *What are the characteristics of an ecosystem? How do ecosystems and organisms change over time, and respond to natural and human interventions? How does matter cycle and energy flow through the biosphere and the ecosystem, and what are the implications of this knowledge for protecting the environment for future generations?
- *Analyze ecosystems and ecological succession in the local area, and describe the relationships and interactions among subsystems and components.
- *Analyze and investigate an aquatic or terrestrial local ecosystem, distinguish between biotic and abiotic factors, and describe how they affect population size.
- *Infer the abiotic effects on life (e.g., light, nutrients, water, temperature).
- *Infer biotic interactions in communities (e.g., predator-prey relationships, inter-specific competition, types of symbiosis).
- *Describe the potential impact of habitat destruction on an ecosystem.
- *Describe the effects of introducing a new species into an environment.
- *Describe the adaptation of species over time due to variation in a population, population size and environmental change.

British Columbia

National Parks' Challenges: Curriculum Connections for British Columbia

Grade 9, Life Science: Diversity/Social Issue/Global Ecosystems

- *Relate the extraction and harvesting of the earth's resources to sustainability and reduction of waste.
- *Evaluate how major natural events and human activity can affect local and global environments and climate change.

Grade 10, Life Science: Diversity/Social Issue/Global Ecosystems

- *Relate the extraction and harvesting of the earth's resources to sustainability and reduction of waste.

*Evaluate how major natural events and human activity can affect local and global environments and climate change.

Manitoba

National Parks' Challenges: Curriculum Connections for Manitoba

Grade 10, Science: Dynamics of Ecosystem

*Discuss the potential consequences for an ecosystem of introducing new species and of species extinction. GLO: E1, E2

*Explain how the biodiversity of an ecosystem contributes to its sustainability. GLO: B5, E1

*Investigate how human activities affect an ecosystem, and use the decision-making model to propose a course of action to enhance its sustainability. Include: impact on biogeochemical cycling, population dynamics, and biodiversity. GLO: B5, C4, C5, C8

Grade 10, Geography: Senior 2, North America, A Geographic Perspective

Unit III The North: Topics and Focusing Questions

1. Defining the North.

2. The primary resource base.

Students should examine the forest industry, mineral extraction, water, and wildlife resources.

3. The Peoples of the North.

4. Current issues within the region.

Unit IV The Western Cordillera: Topics and Focusing Questions

3. The resource base.

c. Tourism.

What is tourism?

Why is the Western Cordillera attractive to tourists? What are the implications of increasing tourism? (Consider: climate, scenery, parks, the perception of users such as skiers, photographers, artists, hikers.)

5. Current issues within the region.

Unit V Atlantic Canada and Appalachia: Topics and Focusing Questions

3. Current issues within the region.

What are the issues of concern to the people of Atlantic Canada and Appalachia? Why?

New Brunswick

National Parks' Challenges: Curriculum Connections for New Brunswick

Grade 10, Life Science: Sustainability of Ecosystems

*Define sustainability.

*Through an introductory discussion, students can reflect on what they value about nature. What is the value of a boreal forest? What if it were to be clearcut? What is sustainability? Are they willing to sacrifice something to ensure sustainability? Is the economy one of growth and expansion at any environmental cost? Does this lead to sustainable practices? What are sustainable practices in your home? How do we know when they are present?

*Communicate questions, ideas, and intentions and receive, interpret, understand, support, and respond to the ideas of others with respect to environmental attitudes. (215-1)

*Explain biotic and abiotic factors that keep natural populations in equilibrium, and relate this equilibrium to the resource limits of an ecosystem. (318-5)

*Explain how biodiversity of an ecosystem contributes to its sustainability. (318-6)

*Plan changes to, predict the effects of, and analyze the impact of external factors on an ecosystem.

*Analyze the impact of external factors on an ecosystem. (331-6)

*Explain why an ecosystem may respond differently to short-term stress and long-term change. (318-4)

*Select, compile, and display evidence and information from various sources, in different formats, to support a given view in a presentation about ecosystem change.

*Communicate questions, ideas, and intentions, and receive, interpret, understand, support, and respond to the ideas of others in preparing a report about ecosystem change. (215-1)

Newfoundland and Labrador

National Parks' Challenges: Curriculum Connections for Newfoundland and Labrador

Grade 10, Science: Unit 1, Life Science, Sustainability of Ecosystems

*Define sustainability.

*Through an introductory discussion, students can reflect on what they value about nature. What is the value of a boreal forest? What if it were to be clearcut? What is sustainability? Are they willing to sacrifice something to ensure sustainability? Is the economy one of growth and expansion at any environmental cost? Does this lead to sustainable practices? What are sustainable practices in your home? How do we know when they are present?

*Communicate questions, ideas and intentions and receive, interpret, understand, support and respond to the ideas of others with respect to environmental attitudes. (215-1)

Northwest Territories

National Parks' Challenges: Curriculum Connections for Northwest Territories

Grade 9, Science: Unit A, Biodiversity

- *Investigate and interpret diversity among species and within species, and describe how diversity contributes to species survival.
- *Investigate and interpret dependencies among species that link the survival of one species to the survival of others (e.g., by providing habitat, food, means of fertilization, or a source of oxygen).
- *Identify impacts of human action on species survival and variation within species, and analyze related issues for personal and public decision making.
- *Describe ongoing changes in biological diversity through extinction and extirpation of native species, and investigate the role of environmental factors in causing these changes (e.g., investigate the effect of changing river characteristics on the variety of species living in the river; investigate the effect of changing land use on the survival of wolf or grizzly bear populations).
- *Evaluate the success and limitations of various local and global strategies for minimizing loss of species diversity (e.g., breeding of endangered populations in zoos, development of seed banks, designating protected areas, development of international treaties regulating trade of protected species and animal parts).

Grade 11, Science: The Biosphere

- *The ability and responsibility of society, through science and technology, to protect the environment and use natural resources judiciously to ensure quality of life for future generations.
- *Appreciate the complexity of our planet.
- *Develop an awareness of one's personal role in the preservation of the environment.
- *Develop a sense of responsibility toward use of our environment.
- *Develop an open-mindedness concerning the views and values of others.
- *Develop an attitude of participation in planning and shaping the future.
- *Develop an awareness of global issues and the contribution of local activity to the resolution of global problems.

Grade 11, Science: Unit B, Understanding Common Energy Conversion Systems

- *Assess the impact of fossil fuel technologies on the environment.
- *Have a sense of personal and shared responsibility for maintaining a sustainable environment.
- *Project the personal, social and environmental consequences of proposed actions.
- *Want to take action for maintaining a sustainable environment.

Grade 11, Science: Unit 3, Energy and Matter Exchange in Ecosystems

- *The biosphere is composed of a diversity of biomes, each with distinctive biotic and abiotic factors.
- *The biosphere is composed of biomes, each with many different ecosystems, characterized by physiographic, climatic, edaphic (soil) and biotic factors.

Nova Scotia

National Parks' Challenges: Curriculum Connections for Nova Scotia

Grade 10, Science

*Students should explore their own paradigms related to the environment. Through an introductory discussion, students can reflect on what they value about nature. What is the value of a boreal forest? What if it were to be clearcut? What is sustainability? Are they willing to sacrifice something to ensure sustainability? Is the economy one of growth and expansion at any environmental cost? Does this lead to sustainable practices? What are sustainable practices in their homes? How do we know when they are present?

*Explore and develop a concept of sustainability.

*Communicate questions, ideas and intentions and receive, interpret, understand, support and respond to the ideas of others with respect to environmental attitudes. (215-1)

*Explain biotic and abiotic factors which keep natural populations in equilibrium and relate this equilibrium to the resource limits of an ecosystem. (318-5)

*Explain how biodiversity of an ecosystem contributes to its sustainability. (318-6)

*Plan changes to, predict the effects of, and analyze the impact of external factors on an ecosystem.

*Analyze the impact of external factors on an ecosystem. (331-6)

*Select, compile and display evidence and information from various sources, in different formats, to support a given view in a presentation about ecosystem change. (214-3, 213-7)

*Communicate questions, ideas and intentions, and receive, interpret, understand, support and respond to the ideas of others in preparing a report about ecosystem change. (215-1)

Grade 10, Geography/Social Studies: Unit 5, Spaceship Earth

*Students will be expected to demonstrate an understanding of the complexity of systems that control the fragile web of life, and analyze the implications for human responsibility in sustaining the ecosystems of our environment.

*Demonstrate the attitudes and values required for proper stewardship of the planet's finite resources and delicate ecosystems.

Nunavut

National Parks' Challenges: Curriculum Connections for Nunavut

Grade 10, Science: Unit D, Investigating Matter and Energy in the Environment

*Should humans as a species be concerned about the effects of their activities on other species and the environment?

*Biotic and abiotic factors and ecosystems.

*Factors affecting population growth.

*Human impact on ecosystems.

- *Identify and assess the needs and interests of society that have led to technologies with unforeseen environmental consequences (e.g., fishing technologies that result in harvesting beyond the rate of reproduction, use of pesticides such as DDT, impact of cars on atmospheric compositions).
- *Define ecosystems in terms of biotic and abiotic factors (e.g., common plants and animals, latitude, altitude, topography).
- *Describe how various abiotic factors influence biodiversity in an ecosystem (e.g., climate, substrate, temperature, elevation).
- *Describe how interactions among organisms limit populations (e.g., predation, parasitism, competition).
- *Assess the impact of the introduction of exotic species on a specific ecosystem or biome.
- *Describe the relationship between land use practices and altering ecosystems.
- *Trace the development of a technological application that has altered an ecosystem.

Ontario

National Parks' Challenges Lesson Plan: Curriculum Connections for Ontario

Grade 9, Geography of Canada (CGC1D): Understanding and Managing Change

- *Demonstrate an understanding of selected factors that cause change in human and natural systems.
- *Select appropriate problem-solving strategies and apply them to a case study (designate a World Heritage Site).

Grade 9, Geography of Canada (CGC1D): Human-Environment Interactions

- *Analyze the ways in which natural systems interact with human systems, then make predictions about the outcomes of these interactions.
- *Explain the role of government in managing resources and protecting the environment.
- *Demonstrate an understanding of how human activities (e.g., agricultural and urban development, waste management, parks development, forest harvesting, land reclamation) affect the environment.
- *Demonstrate an understanding of how natural systems (e.g., climate, soils, landforms, natural vegetation, wildlife) influence cultural and economic activities (e.g., recreation, transportation, employment opportunities).
- *Explain how the effects of urban growth (e.g., development on former farm lands, destruction of wildlife habitats, draining of marshes) alter the natural environment.
- *Produce an evaluation of proposed solutions to environmental problems (e.g., by government, industry, other interested groups) and make recommendations for sustainable resource use.

Grade 10, Science (SNC2P), Biology: Ecosystems and Human Activity

- *Demonstrate an understanding of ecosystems, including the relationship between ecological balance and the sustainability of life.
- *Analyze natural and human threats to a local ecosystem and propose viable solutions to restore ecological balance.

- *Relate issues to environmental sustainability, with a particular focus on issues in Ontario and Canada.
- *Show the relationship between the resources available and the equilibrium of a natural population in an ecosystem.
- *Identify a current local concern or issue involving an ecosystem; formulate scientific questions about the ecological issue and outline experimental procedures for finding answers.
- *Demonstrate the skills required to plan and conduct practical tests on related ecological factors, and collect data using appropriate instruments and techniques safely and accurately (e.g., tests for water quality, air quality, soil composition).
- *Select and integrate information from various sources, including electronic, print, and community resources, to answer the questions chosen.
- *Analyze the data and information gathered to clarify aspects of the concern or issue (e.g., identify costs and benefits from a social, cultural, and/or environmental perspective; predict the consequences of action or inaction; propose possible solutions).
- *Communicate the results of the investigation using a variety of oral, written, and graphic formats (e.g., write a letter to the mayor or organize a public debate).
- *Assess the impact of technological change on an ecosystem (e.g., the introduction of fertilizer and pesticides to soil; the introduction of a genetically engineered plant; the effect of polluted water or air on plants and animals).
- *Identify and evaluate Canadian initiatives in protecting Canada's ecosystems.

Prince Edward Island

National Parks' Challenges: Curriculum Connections for Prince Edward Island

Grade 10, Life Science: Sustainability of Ecosystems

- *Define sustainability.
- *Through an introductory discussion, students can reflect on what they value about nature. What is the value of a boreal forest? What if it were to be clearcut? What is sustainability? Are they willing to sacrifice something to ensure sustainability? Is the economy one of growth and expansion at any environmental cost? Does this lead to sustainable practices? What are sustainable practices in your home? How do we know when they are present?
- *Communicate questions, ideas and intentions and receive, interpret, understand, support and respond to the ideas of others with respect to environmental attitudes. (215-1)

Quebec

National Parks' Challenges: Curriculum Connections for Quebec

Secondary IV, Science: Unit 2, A Stable Ecosystem

- *To attribute a stable ecosystem to certain regulating mechanisms that are the result of interactions among its components.
- *To show that an ecosystem is a group of interacting components.

Intermediate Objectives

- *To distinguish between biotic and abiotic factors based on observations of a given ecosystem.
- *To list both quantitative and qualitative facts about the various components of a given ecosystem.
- *To verify the ecological role of certain biotic and abiotic factors.
- *To identify the different kinds of interactions among the various components of an ecosystem, based on their ecological roles.
- *To describe interactions among living and nonliving things within a given ecosystem.
- *To show that interactions among living and nonliving things are important regulating mechanisms, based on the ways in which these interactions influence the characteristics of an ecosystem.
- *To describe interactions among living things within a given ecosystem.
- *To show that interactions among living things are regulating mechanisms that exist within an ecosystem.
- *To show that interactions among living things are important regulating mechanisms, based on the ways in which these interactions influence the characteristics of an ecosystem.
- *To describe a current example of an ecological imbalance.
- *To identify the regulating mechanisms that are or will be disrupted in this ecosystem.
- *To show that regulating mechanisms are necessary to maintain a balanced ecosystem.
- *To associate quality of life with a well-balanced organism and a stable ecosystem.
- *To verify the changes that have been implemented in order to restore the regulating mechanisms that ensure a balanced ecosystem, by examining similar case studies.

Secondary IV, Science: Unit 4, A Matter of Adaptation.

- *To observe that the environment is constantly changing.

Secondary V, Science: Unit 2, A Stable Ecosystem

- *To attribute a stable ecosystem to certain regulating mechanisms that are the result of interactions among its components.
- *To show that an ecosystem is a group of interacting components.

Intermediate Objectives

- *To distinguish between biotic and abiotic factors based on observations of a given ecosystem.
- *To list both quantitative and qualitative facts about the various components of a given ecosystem.
- *To verify the ecological role of certain biotic and abiotic factors.
- *To identify the different kinds of interactions among the various components of an ecosystem, based on their ecological roles.
- *To describe interactions among living and nonliving things within a given ecosystem.
- *To show that interactions among living and nonliving things are important regulating mechanisms, based on the ways in which these interactions influence the characteristics of an ecosystem.
- *To describe interactions among living things within a given ecosystem.
- *To show that interactions among living things are regulating mechanisms that exist within an ecosystem.

- *To show that interactions among living things are important regulating mechanisms, based on the ways in which these interactions influence the characteristics of an ecosystem.
- *To describe a current example of an ecological imbalance.
- *To identify the regulating mechanisms that are or will be disrupted in this ecosystem.
- *To show that regulating mechanisms are necessary to maintain a balanced ecosystem.
- *To associate quality of life with a well-balanced organism and a stable ecosystem.
- *To verify the changes that have been implemented in order to restore the regulating mechanisms that ensure a balanced ecosystem, by examining similar case studies.

Secondary V, Science: Unit 4, A Matter of Adaptation.

- *To observe that the environment is constantly changing.

Saskatchewan

National Parks' Challenges: Curriculum Connections for Saskatchewan

Grade 9, Science: The Environment

- *Develop compassionate, empathetic and fair-minded students who can make positive contributions to society as individuals and as members of groups. (PSVS)
- *Recognize that the behaviour of an individual can affect the quality of an experience for others.
- *Reflect upon the benefits of cooperative, respectful, or empathetic behaviours in actions that influence the biosphere.
- *Recognize that a balance is needed between the rights of individuals and the well-being of both humankind and all life forms.

Grade 10, Science: Core Unit A: Earth/Environmental Science

- *Appreciate the complexity within natural systems.
- *Examine the impact of historical and contemporary human activity on the biosphere.
- *Identify ways that the impact of human activity can be reduced.
- *Analyze the environmental impact of personal activities and lifestyles.
- *Analyze the effect/impact of the environment on personal activities and lifestyles, and the effect of personal activities on the environment.
- *Use a wide range of language experiences to develop knowledge of natural systems. (COM)
- *Promote both intuitive, imaginative thought and the ability to evaluate processes, experiences, and objects in the context of understanding the impact humans have on the biosphere. (CCT)

Yukon

National Parks' Challenges: Curriculum Connections for Yukon

Grade 9, Life Science: Diversity/Social Issue/Global Ecosystems

*Relate the extraction and harvesting of the earth's resources to sustainability and reduction of waste.

*Evaluate how major natural events and human activity can affect local and global environments and climate change.

Grade 10, Life Science: Diversity/Social Issue/Global Ecosystems

*Relate the extraction and harvesting of the earth's resources to sustainability and reduction of waste.

*Evaluate how major natural events and human activity can affect local and global environments and climate change.