

*Public District School Board Writing Partnership*

Canadian and World Studies

# Course Profile

## **The Environment and Resource Management**

Grade 12

University/College Preparation  
CGR4M

• *for teachers by teachers*

This sample course of study was prepared for teachers to use in meeting local classroom needs, as appropriate. This is not a mandated approach to the teaching of the course. It may be used in its entirety, in part, or adapted.

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### **Acknowledgments**

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## Course Overview

### The Environment and Resource Management, CGR4M, Grade 12, University/College Preparation

**Policy Document:** *The Ontario Curriculum, Grades 11 and 12, Canadian and World Studies, 2000.*

**Prerequisite:** Any University, University/College, or College Preparation course in Canadian and World Studies, English, or Social Sciences and Humanities

## Course Description

Geography is an integrative subject that brings a variety of perspectives, both social and physical, to the study of people, places, and environments around the world. Understanding the processes that shape the earth and knowing how life-forms interact with the environment allows students to view events from an ecological perspective. The Environment and Resource Management course investigates the complexity and fragility of ecosystems and the effects of human activities on them. Students will study the principles of sustainability and resource management and evaluate various approaches to achieving a more sustainable relationship between the environment, society, and the economy.

## Course Notes

This course was created within the parameters of the strands outlined in *The Ontario Curriculum, Grades 11 and 12, Canadian and World Studies, 2000* document. Expectations from the strands were clustered to form five broad units. These units were further subdivided and organized into activities that combine to create a framework for delivery. The sequencing of units takes the student from a global perspective of the earth's natural systems to the human interactions and impacts on these systems. The culminating activity requires students to create an individual 'Environmental Bill of Rights' based on their cumulative understanding of the 'rights and responsibilities' of individuals within a global environmental system. This profile represents one interpretation of the way the course could be delivered. Teachers are encouraged to organize the course in a way that reflects their strengths and expertise and meets the needs of the students.

The Environment and Resource Management course is designed to provide students with a thorough understanding of concepts contained in the course material. Students develop practical skills and apply the knowledge and skills to assist their understanding of the impact of human interactions with the natural environment. Students are provided the opportunity to improve decision-making and problem-solving skills by completing tasks that require geographic inquiry into a variety of topics including environmental assessment and resource management. Many activities are designed to focus on the local area. Teachers are encouraged to provide their students with as many hands-on learning experiences as possible. This University/College Preparation course is also designed to equip students with the knowledge and skills they need to meet the entrance requirements for specific programs offered at universities and colleges. This course should be relevant to both destinations and emphasize theoretical aspects and related concrete applications of the course content. (*Ontario Secondary Schools, Grades 9 to 12, Program and Diploma Requirements, 1999*)

The four Achievement Chart categories appear in *The Ontario Curriculum, Grades 9 and 10, Canadian and World Studies, 1999* and *The Ontario Curriculum, Grades 11 and 12, Canadian and World Studies, 2000*. The chart provides a reference point for all assessment practice and a framework within which to assess and evaluate student achievement. Teachers should employ a variety of methods and strategies to assess student achievement. The suggested procedures for assessment and evaluation of student work are outlined in the document *Program Planning and Assessment, 2000*. Thirty per cent of the grade will be based on a final exam and two final culminating activities. At the start of the course it is essential for

teachers and students to be familiar with the course culminating activity, the Development of an Environmental Bill of Rights. Teachers need to introduce and develop skills that are required for this activity throughout the course. This activity, in the form of an independent study, requires students to spend additional time outside the classroom researching and reflecting on their topic. It is essential that students and teachers develop organizational strategies for tracking progress.

Seventy per cent of the grade is based on assessments and evaluations conducted throughout the course. It is essential that teachers are careful to measure student performance often and in conjunction with the four categories of the Achievement Chart. Student tasks should be clearly stated and based on the expectations of the course. Rubrics should be used when appropriate and should be constructed in a way that clearly identifies for the student the expectations that are being measured, the level at which they are achieving, and a place for personalized comment. This University/College Preparation course provides students with many opportunities to engage in hands-on learning and to express their understanding in various ways. Students develop their reading and writing skills, and have numerous opportunities to research, model, debate, interpret, and apply the products of their inquiries. Complex tasks, such as using technology for research, problem-solving, and making predictions for planning courses of action, draw on all categories of the Achievement Chart. Health and safety considerations relate to the physical and personal well-being of students in class, in community-based learning activities, and in the workplace. Teachers must take all reasonable steps to ensure the safety of students, helping them understand the importance of health and safety issues and the need to assume responsibility for their own safety and the safety of others.

### Units: Titles and Time

Unit 1	Geographic Foundation and Environmental Systems	25 hours
Unit 2	Human-Environmental Interaction: The Consequences	25 hours
* Unit 3	Impact Assessment and Environmental Protection: Monitoring Change	25 hours
Unit 4	Planning for a Sustainable Future	25 hours
Unit 5	Development of an Environmental Bill of Rights – Final Summative Activity	10 hours

\* This unit is fully developed in this Course Profile.

## Unit Overviews

### Unit 1: Geographic Foundations and Environmental Systems

**Time:** 25 hours

#### Unit Description

This unit examines the relationships between the earth's major components: the lithosphere, atmosphere, hydrosphere, and biosphere. Students gain an understanding of energy flows, the structure of ecosystems and the processes that form them. In the culminating activity, students will have an opportunity to complete a geographic inquiry by conducting field research in the local area. Students begin the process of creating an Environmental Database by researching information on different components and issues concerning the natural environment. Information is collected throughout the entire course and is evaluated at the end of the semester.

**Unit Overview Chart**

Activity	Learning Expectations	Assessment Categories	Focus/Task
1.1	SSV.01, SS3.04	Knowledge/ Understanding	Earth's Components - gather information on the earth's spheres and write a scenario based upon the life of an organism - a discussion recognizing that life on earth is a gift and should be protected - produce a checklist of personal dependence on earth's spheres - research an article and write a critical analysis exploring issues
1.2	SS3.01, GI1.01, GI2.03	Knowledge/ Understanding Communication	Spaceship Earth and Systems - defines systems - prepare a systems diagram based upon a model - explore inputs, outputs and boundaries relating to systems - produce a map of events that have an effect on the earth's spheres
1.3	SS1.03, SS2.02, SS2.03, GI2.03	Knowledge/ Understanding Thinking/ Inquiry Application	Flow of Energy and Matter Through Ecosystems - defines ecosystems - outlines role of producers, consumers, and decomposers - create a flow chart of energy moving through an ecosystem and of a food chain - presentations of a nutrient cycle - class discussion of interdependent systems and how this relates to the development of a just and compassionate society, e.g., human influences on the food chain
1.4	SSV.02, SS1.01, SS2.04, UC1.01, GI1.01	Knowledge/ Understanding Application Thinking/ Inquiry	Ecosystems-Ecological Processes - discussion on the dynamic nature of ecosystems - an exploration of the concept "eco-justice" – write a report applying the concept of succession using a Canadian example - create a written report based on research pertaining to ecological change
1.5	SSV.03, SS1.02, SS1.04, SS2.01, SS3.02	Knowledge/ Understanding Communication Application	Natural Systems - a discussion on the definition and characteristics of biomes - explores the influence of temperature and precipitation on biome regions - complete an organizer by gathering information from student presentations of biome regions - investigation of the properties of soil - write a report on soil-conservation practices illustrating respect for the environment and wise use of resources

Activity	Learning Expectations	Assessment Categories	Focus/Task
1.6	GIV.02, SS3.05, GI1.04, GI2.08, GI2.09	Knowledge/ Understanding Thinking/ Inquiry Communication Application	Field Research Culminating Activity: - a discussion on student expectations for field research - each member of the field team writes a report from a field study based on the local bioregion (effective communications, decision-making, problem-solving, and management skills are required) - create a visual presentation based on field research

## Unit 2: Human-Environmental Interaction: The Consequences

Time: 25 hours

### Unit Description

This unit provides students with the opportunity to investigate the roles and effects of human linkages to the Biosphere and Ecological systems. Humans have a dramatic effect on the natural landscape, and this unit focuses on the impact of rural and urban land use practices, as well as environmental degradation and global consumption. On our planet, resources are not distributed evenly. Students examine the spatial distribution of the planet's resources, and the short- and long-term consequences of promoting and maintaining sustainability. In the culminating activity, students will research the relationship between environmental degradation caused by humans altering the natural environment to meet their needs and its effects on human health, or the impact of an introduced species into an environment. Students continue to add to their Environmental Data Base.

### Unit Overview Chart

Activity	Learning Expectations	Assessment Categories	Focus/Task
2.1	HE1.01, HE1.02, HE1.04, GC1.03, GC3.05, GI1.02, HEV.01, GC3.01	Knowledge/ Understanding Communication Thinking/ Inquiry	Humans in Systems Human linkages to Biosphere/Ecological Systems - short- and long-term effects - the differences between wants and needs - a review of different viewpoints - traditional ecological knowledge
2.2	HE2.05, HE3.02, HE3.04, UC3.02, HEV.02, GC3.01	Knowledge/ Understanding Thinking/ Inquiry	Interrelationships between the Environment/ Economy/Society - impact of urban and rural land use practices - interaction between human and natural systems within local bio regions - threats to spaces and species/preservation
2.3	HE2.01, HE2.02, HE2.04, GI1.02, HEV.03	Knowledge/ Understanding Thinking/ Inquiry	Resources: Availability and Use - spatial distribution of a resource - factors that determine distribution and short and long-term availability - distribution of inhabited areas vs. resource availability - patterns of habitation vs. resource availability - dependence of individual or groups on a resource

Activity	Learning Expectations	Assessment Categories	Focus/Task
2.4	UC1.02, GC2.01, GI2.01, GI1.02, GI2.04, GI3.01, GCV.03	Knowledge/ Understanding Thinking/ Inquiry	Environment and Resources Management: Examples on a Global Scale - impact of human activity in a place, e.g., Chernobyl - patterns of global consumption vs. environmental degradation - media presentations of environmental and resource management issues
2.5	HE1.04, HE2.04, GC1.01, GI2.04, GI3.01, GI1.02, GCV.02	Knowledge/ Understanding Thinking/ Inquiry	Population Growth, Consumption and Sustainability on a Global Scale: - perceptions of nature, views of environmental population growth - economic activity and pressure on resources and natural systems
2.6	HE1.03, HE2.03, HEV.02, HE2.05, HE3.01, HE3.02, GI2.04, UC3.03, GI3.01, GI1.02, UC2.04	Knowledge/ Understanding Thinking/ Inquiry	Positive and Negative Impacts of Economic, Social, Political and Technological Changes on the Environment: - proliferation and use of chemicals/the effects on people and the environment - human activities that alter the environment - the impact of rural and urban land use on the environment - personal and class consumption of resources (renewable/non-renewable) and waste production
2.7	HE3.01, HE3.03, SS3.03, GI2.06, GI3.03, GI1.02, HEV.03	Knowledge/ Understanding Thinking/ Inquiry Application Communication	Research and report on the relationship between environmental degradation caused by humans altering the natural environment to meet human needs and its effects on human health/or the impact of a introduced species into an environment This maybe done as a poster assignment

### Unit 3: Impact Assessment and Environmental Protection: Monitoring Change

**Time:** 25 hours

#### Unit Description

Throughout this unit, students identify and explore issues related to the management of the environment and resources at the local, provincial, national, and international levels. Students apply an Environmental Impact Assessment template to model ways that environmental or resource management issues may be analysed. Analysis of an international environmental and resource management issue such as air quality leads to a series of one-on-one debates. Students write a Position Paper on an international environmental issue. Students review and assess the effectiveness of Canadian environmental legislation by local, provincial, and federal governments for the sustainability of a specific resource. A summative activity, designed to reinforce the steps of the planning process and how it applies to managing change, takes the form of a student role-playing activity. In this simulation of an arbitration hearing, groups of students represent the major interest groups in a land use dispute over development in the local area. This model may be applied to a local study appropriate to the geographic location of the student. Students continue to add to their Environmental Data Base.

### Unit Overview Chart

Activity	Learning Expectations	Assessment Categories	Focus/Task
3.1	UC1.04, GI1.04, GI2.03, GI2.09, GIV.01	Knowledge/ Understanding Thinking/ Inquiry	<p>What is an Issue? Environmental versus Resource Management Issues</p> <ul style="list-style-type: none"> <li>- purpose/nature of Environmental Impact Assessment (EIA)</li> <li>What is an EIA model?</li> <li>- environmental principles and initiatives for sustainability and implications for the environment and the economy</li> </ul>
3.2	UCV.03, GCV.01, GCV.02, GCV.03, UC2.02, UC2.05, GI2.02, GI2.03, GI2.09, GC3.01	Knowledge/ Understanding Thinking/ Inquiry	<p>International Environmental and Resource Management Issues</p> <ul style="list-style-type: none"> <li>- What is the international community doing? How effective are their efforts?</li> <li>- What is the balance between people and their environment/the need to balance human needs and environmental protection?</li> <li>- How can we improve the balance?</li> <li>- Future technologies/implications</li> <li>- Cause and effect of environmental change</li> <li>- International solutions to environmental problems, e.g., depletion of a resource</li> <li>- Bias in information relative to global environmental issues</li> <li>- Student Position Paper on an issue</li> </ul>
3.3	UCV.02, UCV.03, UC1.03, UC2.01, UC2.02, UC2.03, UC2.05, UC3.05, GI2.07, GI2.08, GI2.09, GI2.04, GI2.05, GI2.06, GI3.01	Knowledge/ Understanding Thinking/ Inquiry Communication Application	<p>Local, Provincial and Federal Policy concerning Environmental Issues</p> <ul style="list-style-type: none"> <li>- Environmental Legislation: purpose/effects/influences/how shaped</li> <li>- Environmental policies effects on economy, e.g., job creation, environmental protection</li> <li>- Future technologies-implications/evaluate</li> <li>- Evaluate the efforts of individuals and groups to identify problems and the effectiveness of their goals</li> <li>- What are the causes and effects of environmental change over time?</li> </ul>

Activity	Learning Expectations	Assessment Categories	Focus/Task
3.4	UCV.01, UC3.01, GI2.09, GI2.05, GI2.03, GI3.01, GI3.02, GI3.03, GIV.03	Knowledge/ Understanding Thinking/ Inquiry Application Communication	Role Play Simulation: ‘Local Study: A Lesson in Impact Assessment and Environmental Protection’ - Students review the environmental impact of urban development on the select local study and possible long term solutions - Students role-play the different interest groups concerning development and prepare a series of presentations to an arbitration panel - Students prepare a rebuttal to the arbitration panel in the form of a Letter to the Editor

## Unit 4: Planning for a Sustainable Future

**Time:** 25 hours

### Unit Description

This unit begins with an examination of the rights and responsibilities of individuals to preserve the natural environment. Students investigate the contributions of various non-governmental organizations in identifying and solving environmental issues. In particular, the focus is on the impact these organizations have on planning at the local, regional, national and international levels. Students investigate and evaluate Canada’s roles and responsibilities in shaping a sustainable future. In planning for a sustainable future, students are asked to predict the impacts of resource management on environmental problems to be faced this century. Students continue to add to their Environmental Database.

### Unit Overview Chart

Activity	Learning Expectations	Assessment Categories	Focus/Task
4.1	UC1.05, GI1.04, GI3.04, UCV.01	Knowledge/ Understanding Thinking/ Inquiry	Introduction: - identify and evaluate a variety of ways to resolve environmental concerns - determine the rights and responsibilities of individuals to preserve the environment
4.2	UCV.03, UC1.06, GI1.04, GI1.05, GC2.04, GIV.04, GI3.04, UCV.02	Knowledge/ Understanding Thinking/ Inquiry	Local Planning - explain how non-governmental organizations (NGOs) assist in solving environmental issues - critique or defend a local sustainability or resource management decision - research careers in local environmental and/or resource management
4.3	UCV.03, UC1.06, GI1.04, GI1.05, GC2.04, GIV.04, GI3.04, UCV.02	Knowledge/ Understanding Thinking/ Inquiry	Regional Planning - examine the role of NGOs in solving issues of local or regional concerns, e.g., STORM, N.E.C. - critique or defend a regional NGO’s efforts in promoting sustainability - research careers in regional environmental and/or resource management

Activity	Learning Expectations	Assessment Categories	Focus/Task
4.4	UCV.03, GI1.05, GIV.04, GI1.04, UC1.06, GC1.02, GC2.04, GI3.04, UCV.02, GI3.06	Knowledge/ Understanding Thinking/ Inquiry	National Planning - examine the role of NGOs in solving issues of national concern, e.g., Evergreen, Sierra Club - critique or defend a national NGO's efforts in promoting sustainability - identify the need for national cooperation and understanding - justify the choice and distribution of Canada's World Heritage Sites - research careers in national environmental and/or resource management
4.5	UCV.03, GI1.05, GC1.02, GC1.04, GC2.02, GC2.03, UC1.06, GC2.04, GI1.04, GI1.03, GI3.04, GIV.04	Knowledge/ Understanding Thinking/ Inquiry	International Planning - examine the role of NGO's efforts in solving issues of global concern, e.g., United Nations, Greenpeace, World Wildlife Fund - critique or defend an international NGO's efforts in promoting sustainability - evaluate Canada's participation in international organizations - identify the need for international cooperation in managing resources and in the protection of the environment - research careers in global environmental and/or resource management
4.6	UCV.03, UC3.06, GI1.04, UC3.01, HE3.05, UC1.05	Knowledge/ Understanding Thinking/ Inquiry Communication Application	A Sustainable Future - predict impacts of resource management or environmental problems throughout the next century - produce a case study to determine the impact of our continued use of resources and the need to plan for a sustainable future (This may be at the local, regional, or national level)

## Unit 5: Developing an Environmental Bill of Rights- Final Summative Activity

**Time:** 10 hours

### Unit Description

Students submit their Environmental Database which was compiled throughout the course, and a reflection paper of their compilation for a summative evaluation. As a culminating activity, students create an individual Environmental Bill of Rights based on their cumulative understanding of the 'rights and responsibilities' of individuals within a global environmental system. This activity is presented to the class. A class discussion creates a consensus for the creation of a final product to be called CGR4M: An Environmental Bill of Rights.

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### Unit Overview Chart

Activity	Learning Expectations	Assessment Categories	Focus/Task
5.1	GI1.04, GIV.02	Knowledge/Understanding Application Communication Thinking/Inquiry	Students submit their Environmental Database and a five-page reflection paper of their compilation for a summative evaluation.
5.2	GI3.05, GI3.02, HEV.01, UCV.01	Knowledge/Understanding Thinking/Inquiry Communication Application	Students develop and present an individual Environmental Bill of Rights. A class consensus will create a final product called CGR4M: An Environmental Bill of Rights.
5.3			Final Exam

### Teaching/Learning Strategies

Recognizing the diverse backgrounds and the multiple intelligences of our students, it is essential that a variety of teaching/learning strategies be employed to ensure student success. Opportunities to develop critical thinking skills such as formulating a hypothesis, identifying bias and viewpoints, collecting and analysing research data are essential. Using computers to research and record data as well as to indicate spatial relationships (GIS) will help students develop essential technological skills. Individual, small group, and whole class activities that provide opportunities for reading, writing, and the sharing of information will develop thinking skills and understanding of concepts. Following are some Teaching/Learning Strategies the teacher may wish to employ in the geography classroom.

*Aerial Photo Analysis* – examine photos of landforms for common characteristics

*Brainstorming* – group generation of initial ideas expressed without analysis

*Case Study* – investigating a real or simulated problem

*Classifying* – grouping according to an identified pattern

*Cooperative Learning* – small group investigation or problem solving

*Conferencing* – student-to-student and student-to-teacher discussion

*Computer-Assisted Learning*– use of a computer to learn or reinforce material

*Debate* – informed research topics articulated in a formal process

*Diagramming* – synthesizing concept information into visual illustration

*Direct Instruction* – teacher-led lessons

*Discussion* – exchange of ideas on an issue for clarification of views

*Field Trips* – practical application of geographic inquiry skills

*Games* – team quizzes

*Graphing* – visual tool for problem solving

*Guest Speakers* – experts in the field

*Journal writing* – reflective writing to share goals, ideas

*Lectures* – dissemination of information by speakers or teachers

*Mapping* – representing physical, demographic, numerical data through visual forms

*Mind Mapping* – mental images drawn on paper

*Note Making* – summarizing text

*Organizers* – an organized outline, based on a pattern, provided as a direction to be followed leading to a desired product

*Portfolio* – collection of student's work

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*Poster Making* – synthesizing information or concepts to deliver a message or advertisement

*Presentation/Report* – oral, written, and visual presentation of researched topic to a specific audience or person

*Reading* – periodicals, articles, journals, newspapers, magazines, or scripture for information on a selected topic or issue

*Role playing/Simulations* – enhances metacognition and serves as a hypothesis for predicting actions

*Scenario Writing* – describes a situation

*Seminars* – presentation of an opinion or thesis

*Statistical Analysis* – collection and reporting of data

*Video Analysis* – viewing with a purpose

## **Assessment & Evaluation of Student Achievement**

The primary purpose of assessment and evaluation is to improve student learning. In order to give students an opportunity to improve their learning in this course, a variety of formative and summative assessment tools are used. The Achievement Chart found on page 246 of *The Ontario Curriculum, Grades 11 and 12, Canadian and World Studies, 2000* provides a reference point for all assessment practices and a framework within which to assess and evaluate student achievement. The four categories identified on the Achievement Chart are identified as Knowledge/Understanding, Thinking/Inquiry, Communication, and Application. The categories encompass the curriculum expectations in all courses in Canadian and World Studies. *The Ontario Curriculum, Program Planning and Assessment, Grades 9 to 12, 2000*, outlines the philosophy and guiding principles concerning assessment and evaluation for Ontario teachers. Teachers ensure there is a balance of approaches to assessment, with students actively involved in the establishment of task criteria and assessment tools. Prior learning and level of skill are determined by the teacher through diagnostic assessment. Assessment strategies should be directly linked to specific expectations based on established criteria. Teachers collect exemplars of student tasks to support student achievement. As outlined in *The Ontario Curriculum, Grades 9 to 12, Program Planning and Assessment*, the final evaluation accounts for 30% of the grade and 70% is assigned to the evaluations conducted throughout the course. In this profile, Developing an Environmental Bill of Rights is used as the course culminating activity and it is recommended that it count for 5% of the final evaluation.

The model below could be used to assess and evaluate student achievement:

### **Formative Ongoing Assessment And Summative Unit Evaluation 70%**

- Assignments
- Lab Exercises
- Tests and Quizzes
- Independent Field Study (Process)

### **Summative Final Evaluation 30%**

- Exam
- Environmental Data Base
- Environmental Bill of Rights

## **Accommodations**

With assistance and appropriate teaching and learning strategies, students are expected to achieve success in Geography. Appropriate adaptations in planning, assessment, and evaluation should include strategies that provide students every opportunity to meet the expectations of the course. Working in collaboration with special education personnel, the teacher must become familiar with the Individual

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Education Plans (IEPs) of all students with special needs and the specific learning strategies that work best with each student. Some students may require modifications to expectations (see *Ontario Secondary Schools, Grades 9 to 12, 1999*). Geography teachers are encouraged to review exceptional student IEPs and decide how best to assist the individual in meeting the expectations of this course.

Specific accommodations that may be required are:

- provide extra time for completion of assignment;
- provide opportunities for oral conferencing
- cue the student to record information;
- provide reading materials at the students' instructional level;
- provide access to a computer for word processing;
- permit taping of notes;
- provide a printed copy of overhead or board notes;
- chunk assignments into manageable parts and monitor progress.

Accommodations for students with learning or physical disabilities may include the following:

- providing for flexible timelines regarding the completion of projects and assignments;
- modifying handouts in terms of language and content used, and in terms of size and easy-to-read fonts;
- arranging for peer assistance;
- providing a simplified list of terminology prior to the activity;
- providing oral preplanning of activities;
- allowing students to work in an alternate setting (e.g., resource room) where students can receive one-on-one assistance;
- providing opportunities to redo all or part of a task
- adapting tests and exams as recommended in IEP, e.g., time, use of technology, use of a scribe
- providing multicultural elders and members of Canada's Aboriginal peoples to share their perspectives on the environment

Consideration for students learning English as their second language is also necessary. The classroom teacher should be familiar with the *Ontario Curriculum Grades 9 to 12, English As a Second Language and Literacy Development* where an ESL/ELD teacher is not available.

Accommodations for ESL/ELD students may include the following:

- providing a specialized geographic vocabulary;
- activities such as reading/listening tasks (case study/ video viewing) need a specific and concrete product of students;
- providing student/teacher conferencing;
- arranging for peer assistance;
- combining both written and verbal instructions;
- highlighting keywords/phrases to be incorporated into the students dictionary
- grouping students according to first language for brain-storming sessions;
- allowing practice sessions for oral presentations;
- providing sets of reference notes, outlines, or critical information, as well as models of charts, timelines or diagrams;
- reinforcing main ideas by using the think/pair/share peer-assessment strategies.

Teachers are encouraged to be flexible in their planning and assessment to best meet the needs of individual students with special needs.

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## Resources

### Books

- Abram, David. *The Spell of the Sensuous*. 1997. ISBN: 067977639-7
- Allen, John L. *Student Atlas of Environmental Issues*. 2001. ISBN: 0697365204
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- Commonor, Barry. *Making Peace with the Planet*. 1992. ISBN: 1565840127
- Cozic, Charles P. *Global Resources: Opposing Viewpoints*. 1998. ISBN: 1565106733
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- Draper, Dianne. *Our Environment: A Canadian Perspective*, 2nd Edition. 2002 ISBN: 0176222367
- Dwivedi, O.P., et al. *Sustainable Development and Canada*. 2001. ISBN: 1551113236
- Dudley, William. *The Environment: Opposing Viewpoints*. 2001. ISBN: 0737706538
- Ehrlich, Paul R. *How the Diversity of Life Sustains Us*. 1998. ISBN: 1559635207
- Goldfarb, Theodore D. *Taking Sides: Clashing Views on Controversial Environmental Issues*. 2000. ISBN: 0072430974
- Harrison, Paul. *Aaas Atlas of Population and Environment*. 2001. ISBN: 0520230841
- Huber, Peter W. *Hard Green: Saving the Environment from the Environmentalists (A Conservative Manifesto)*. 2000. ISBN: 0465031129

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Knudtson, Peter, and David Suzuki. *Wisdom of the Elders*. 1997. ISBN: 0773756523

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Meadows, Donella H., et. al. *Beyond the Limits: Confronting Global Collapse, Envisioning a Sustainable Future*. Reprint Edition. 1993. ISBN: 0930031628

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Pimm, Stuart L. *The World According To Pimm: A Scientist Audits the Earth*. 2001. ISBN: 0071374906

Pointing, Clive. *A Green History of the World: The Environment and the Collapse of Great Civilizations*. Reprint Edition. 1993. ISBN: 01400176608

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Shabecoff, Philip. *Earth Rising: American Environmentalism in the 21st Century*. 2000. ISBN: 1559635835

Stauber, John. *Toxic Sludge is Good for You-Lies, Damn Lies and the Public Relations Industry*. 1997. ISBN: 1567510604

Stevens, William K. *The Change in the Weather: People, Weather, and the Science of Climate*. 1999. ISBN: 0195074696

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Topfer, Klaus. *Global Environmental Outlook 2000. United Nations Environment Programme*. 2000. ISBN: 1853835889

Vital Signs 2001: *The Environmental Trends That Are Shaping Our Future, 2001 Edition*. Worldwatch Institute, 2001. ISBN: 0393321762

Wilson, Edward Osborne. *The Diversity of Life*. 1999. ISBN: 0393319407

*World Resources 2000-2001—People and Ecosystems: The Fraying Web of Life*. World Resources Institute. 2000. ISBN: 1569734437

Wright, Richard T, and Bernard J. Nebel. *Environmental Science: Toward A Sustainable Future*. Prentice-Hall, 2001. ISBN: 0-13-032538-4

## Organizations

Greenpeace

Earth Roots

World Wildlife Fund

Bruce Trail Organization

Federation of Ontario Naturalists

Sierra Club

Earth First

Save the Rouge Valley System Inc.

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## Periodicals

*Adbusters*

*Environment*

*Alternatives Journal*

*Environment: Where Science and Policy Meet*

*Canadian Geographic*

*Green Teacher*

*E Magazine*

*The Journal of Environmental Education*

*Earth First! – The Radical Environmental Journal*

*On Earth* formerly *Amicus Journal*

*The Ecologist*

*World Press Review*

*The Economist*

*World Watch*

## Multimedia and Software

*Ah...the Money, the Money, the Money.* Video: logging vs. wilderness preservation. National Film Board. 2001.

*Champions of the Land.* Video: development of conservationist movement. DiscoverySchool.Com

*Footprints in the Delta.* Video: Peace-Athabasca delta ecosystem. National Film Board. 1999

*Natural Connections.* four videos from Bullfrog Films:

- *Introduction to Biodiversity.* 1999. ISBN: 1-56029-842-1
- *Forests, Biodiversity and You.* 1999. ISBN: 1-56029-845-6
- *Keystone Species.* 1999. ISBN: 1-56029-844-8
- *Biodiversity vs. Extinction.* 1999. ISBN: 1-56029-846-4

*Sustainable Development and the Ecosystem Approach.* 2 video set. 1993. Produced by Environment Canada and distributed by the National Film Board.

*Race to Save the Planet.* 10-part video series 2002. Annenberg/CPB Channel. PBS Television  
'Worldwatch CD-ROM. Worldwatch Institute

## Websites

**Note:** The URLs for the websites have been verified by the writers prior to publication. Given the frequency with which these designation change, teachers should always verify the websites prior to assigning them for student use.

### Websites (General)

The Canadian Resource Page – <http://www.cs.cmu.edu/Unofficial/Canadiana/README.html>

David Suzuki Foundation – [www.davidsuzuki.org](http://www.davidsuzuki.org)

Gary's Geographic Gnome – <http://www.jgds.com/gnome/>

Geographic Information Systems, K-12 – [www.esri.com/industries/k-12/index.html](http://www.esri.com/industries/k-12/index.html)

Geography World – <http://members.aol.com/bowermanb/101.html>

Eco-Portal – [www.eco-portal.com](http://www.eco-portal.com)

### Websites (Specific)

Canada Centre For Remote Sensing – <http://www.cct.rncan.gc.ca/>

Canada's Aquatic Environments – <http://www.aquatic.uoguelph.ca/index.asp>

Canadian Geographic Online – <http://www.canadiangeographic.ca/>

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The Great Lakes – <http://www.great-lakes.net/lakes/>  
The Great Lakes: An Environmental Atlas and Resource Book  
– <http://www.on.ec.gc.ca/great-lakes-atlas/>  
Green Peace – [www.greenpeace.org](http://www.greenpeace.org)  
The International Development Research Centre – <http://www.idrc.ca/>  
The International Institute for Sustainable Development – <http://iisd1.iisd.ca/>  
Media Watch – <http://www.mediawatch.ca/>  
National Round Table on the Environment and the Economy  
– [http://www.nrtee-trnee.ca/eng/home\\_e.htm](http://www.nrtee-trnee.ca/eng/home_e.htm)  
Pollution Watch Scorecard – <http://www.scorecard.org/pollutionwatch/>  
Species at Risk in Canada – <http://www.speciesatrisk.gc.ca/sar/>  
Sustainable Development – <http://www.dfait-maeci.gc.ca/sustain/SustainDev/overview-e.asp>  
Sustainable Development (F.A.O.) – [http://www.fao.org/waicent/faoinfo/sustdev/index\\_en.htm](http://www.fao.org/waicent/faoinfo/sustdev/index_en.htm)  
The World Heritage List – [www.unesco.org/whc/heritage.htm](http://www.unesco.org/whc/heritage.htm)  
World Resources Institute – <http://www.wri.org/>  
Worldwatch Online – <http://www.worldwatch.org/>

### **Note Concerning Permissions**

Units in this Course Profile make reference to the use of specific texts, magazines, films, videos, and websites. Teachers need to consult their board policies regarding use of any copyrighted materials. Before reproducing materials for student use from printed publications, teachers need to ensure that their board has a Cancopy licence and that this licence covers the resources they wish to use. Before screening videos/films with their students, teachers need to ensure that their board/school has obtained the appropriate public performance videocassette licence from a authorized distributor, e.g., Audio Cine Films Inc. Teachers are reminded that much of the material on the Internet is protected by copyright. The copyright is usually owned by the person or organization that created the work. Reproduction on any work or substantial part of any work on the Internet is not allowed without permission of the owner.

### **OSS Considerations**

This profile is designed to aid teachers in developing and delivering The Environment and Resource Management Course. This course would fulfill the requirements for an additional credit in Canadian and World Studies within the 18 compulsory credits required for an Ontario Secondary School Diploma in section 3.1.1 (p. 9) and Appendix 5 (p. 72) of *Ontario Secondary Schools, Grade 9-12, Program and Diploma Requirements, 1999*. The needs of both College and University-bound students have been considered and the activities have been constructed with a balance of theory and application. Expectations for accommodations are outlined in section 7.12 (pp. 56-8) and Appendix 6 (pp. 74-75). The basis for assessment, evaluation, and reporting practices is outlined on pp. 13-16 of *The Ontario Curriculum, Grades 9-12, Program Planning and Assessment, 1999*. Strategies for assessment and evaluation are therefore based on the four categories of the Achievement Chart as described in *The Ontario curriculum, Grades 11 and 12, Canadian and World Studies, 2000* policy document. The analytical skills that can be developed in this course can be applied in various situations. By participating in co-op programs and working in the community, students begin to understand the relevance of their studies. An essential component of geographic study is learning to use computers to research and interpret data. Geographic information systems, global positioning systems, and spreadsheet software prepares students for the future.

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# Coded Expectations, The Environment and Resource Management, Grade 12, University/College Preparation, CGR4M

## Geographic Foundations: Space and Systems

### Overall Expectations

- SSV.01** · analyse and explain relationships between the earth's major components: the lithosphere, atmosphere, hydrosphere, and biosphere;
- SSV.02** · explain key ecological processes and their significance for ecosystem health;
- SSV.03** · analyse the spatial distribution of global biomes and explain the natural conditions that shape these patterns.

### Specific Expectations

#### Understanding Concepts

- SS1.01** – demonstrate an understanding of the variety, complexity, and evolutionary characteristics (e.g., primary and secondary succession) of selected ecosystems;
- SS1.02** – explain the role of micro-organisms in maintaining soil fertility;
- SS1.03** – demonstrate an understanding of the process of bioaccumulation of chemicals within the food chain;
- SS1.04** – demonstrate an understanding of the factors that affect the survival of a species (e.g., genetic characteristics, availability of habitat, population size).

#### Developing and Practising Skills

- SS2.01** – analyse selected relationships between the earth's diverse natural systems (e.g., climate, soils, vegetation, wildlife);
- SS2.02** – explain the flow of matter and energy through ecosystems (e.g., nutrient cycling; carbon, nitrogen, and water cycles; energy flow);
- SS2.03** – explain interactions between producers, consumers, and decomposers within a selected ecosystem;
- SS2.04** – analyse the factors that contribute to the fragility and/or resilience of selected ecosystems.

#### Learning Through Application

- SS3.01** – explain how the earth is a self-sustaining system (e.g., using the analogy of a spaceship);
- SS3.02** – explain the combination of biotic and abiotic factors and processes that produce a selected soil, wetland, or forest;
- SS3.03** – research and report on the impact of an introduced species (e.g., zebra mussel, purple loosestrife, Asian beetle) on an ecosystem;
- SS3.04** – evaluate the contributions made by various characteristics of the biosphere, lithosphere, atmosphere, and hydrosphere to their daily life;
- SS3.05** – analyse interactions between the distinctive natural features (e.g., climate, watershed, plants, animals) of the local bioregion.

## Human-Environment Interactions

### Overall Expectations

- HEV.01** · demonstrate an understanding of how humans are an integral part of an ecological system and of how human activity has short- and long-term effects on the natural environment;
- HEV.02** · analyse and evaluate interrelationships between the environment, the economy, and society;
- HEV.03** · analyse patterns of resource availability and use.

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## Specific Expectations

### Understanding Concepts

- HE1.01** – demonstrate an understanding of how human well-being and survival depend on complex linkages with other components of the biosphere;
- HE1.02** – explain the difference between needs and wants;
- HE1.03** – demonstrate an understanding of the proliferation and uses of synthetic chemicals in society and identify the effects of selected chemicals on human health and the environment;
- HE1.04** – identify differences in the perceptions of nature and the views on environmental preservation of selected individuals and groups.

### Developing and Practising Skills

- HE2.01** – analyse spatial distribution patterns of a selected resource and identify the factors that determine its distribution and its short- and long-term availability;
- HE2.02** – compare distribution patterns of inhabited regions with patterns of resource availability;
- HE2.03** – analyse ways in which selected human activities alter the natural environment (e.g., the effect of clear-cutting west coast forests on salmon spawning, the effect of chlorofluorocarbon use on the ozone layer);
- HE2.04** – analyse the ways in which various groups or individuals (e.g., indigenous peoples, lumber companies, pharmaceutical companies, farmers, tourists) depend on a selected resource (e.g., a tropical rain forest) and evaluate the environmental, economic, and social implications of their dependence on the resource;
- HE2.05** – explain the impact of selected rural and urban land use practices (e.g., irrigation, use of pesticides on crops, development in the buffer zone of a wetland) on human and natural systems.

### Learning Through Application

- HE3.01** – estimate personal and class consumption of renewable and non-renewable resources and production of wastes;
- HE3.02** – analyse interactions between human systems (e.g., land use, transportation networks, culture) and natural systems within the local bioregion;
- HE3.03** – research and report on the relationship between environmental degradation and human health concerns;
- HE3.04** – explain the factors that threaten the preservation of wild spaces and the relationship between preservation of wild spaces and preservation of species;
- HE3.05** – predict the social, economic, and environmental impacts of the extraction and depletion of selected resources in a particular location (e.g., the effect of depletion of fish stocks on the Atlantic provinces, of depletion of caribou populations on indigenous peoples, of extinction of rain forest species on the pharmaceutical industry).

## Global Connections

### Overall Expectations

- GCV.01** · analyse environmental and resource management issues on a global scale;
- GCV.02** · analyse the relationships between global population growth, accelerating consumption of resources, and sustainability of ecosystems on a global scale;
- GCV.03** · explain the efforts of the international community to deal with environmental and resource management issues and evaluate their effectiveness.

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## **Specific Expectations**

### **Understanding Concepts**

- GC1.01** – demonstrate an understanding of how growth in population and economic activity around the world increases pressure on natural resources and natural systems;
- GC1.02** – explain the requirements for including natural sites on the World Heritage List;
- GC1.03** – identify ways in which the “traditional ecological knowledge” and activities of indigenous peoples affect the environment;
- GC1.04** – demonstrate an understanding of the need for international cooperation in achieving the sustainable use of global resources.

### **Developing and Practising Skills**

- GC2.01** – analyse the relationships between global resource consumption and environmental degradation;
- GC2.02** – evaluate the effectiveness of selected organizations and agreements in implementing solutions to global environmental concerns;
- GC2.03** – evaluate Canada’s participation in selected international organizations and agreements that deal with global environmental concerns;
- GC2.04** – produce a critique or defence of selected viewpoints regarding a sustainability or resource management issue.

### **Learning Through Application**

- GC3.01** – predict the effects of climate change on a selected region of the world;
- GC3.02** – compare Canada’s protection of endangered spaces and species with that of another country;
- GC3.03** – describe the distribution of Canada’s natural World Heritage Sites and explain why selected sites were chosen;
- GC3.04** – make recommendations for wilderness sites that could be protected in the future;
- GC3.05** – produce a survey of how people in the school and local community perceive nature and classify their attitudes towards a global environmental issue.

## **Understanding and Managing Change**

### **Overall Expectations**

- UCV.01** · evaluate the impact of economic, social, political, and technological change on natural environments;
- UCV.02** · analyse the purpose and effects of current and evolving environmental legislation and regulations at the local, provincial, and national levels;
- UCV.03** · evaluate a variety of ways to resolve environmental and resource management concerns on the local, regional and global scale.

### **Specific Expectations**

#### **Understanding Concepts**

- UC1.01** – demonstrate an understanding of concepts associated with change (e.g. paradigm shift, world view, synergy, trends, adaptation);
- UC1.02** – explain the ways in which human activity in one place may cause changes to the environment in another place (e.g., effects of fallout from the Chernobyl disaster, effects of acid precipitation from distant airborne emissions);
- UC1.03** – explain how environmental policies can affect the economy (e.g., job creation or reduction, health costs, future costs of lack of environmental protection);
- UC1.04** – demonstrate an understanding of the purpose and nature of environmental impact assessment studies;

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**UC1.05** – describe the rights and responsibilities of individuals with respect to protecting the environment for future generations;

**UC1.06** – explain how selected non-governmental organizations assist in finding solutions to environmental problems.

### **Developing and Practising Skills**

**UC2.01** – explain selected environmental protection principles and initiatives (e.g., voluntary compliance, polluter-pays principle, zero discharge, wildlife migration corridors, pollution taxes and credits) and predict their implications for a sustainable environment and economy;

**UC2.02** – explain ways to improve the balance between human needs and the protection of natural systems (e.g., organic food production, wetland restoration);

**UC2.03** – evaluate the implications for the future of developments in selected areas of technology (e.g., renewable energy technologies, biotechnology, forest-harvesting technologies);

**UC2.04** – explain the economic and environmental implications of reusing and recycling selected products (e.g., computers, photocopier toner cartridges, cars);

**UC2.05** – evaluate efforts by individuals and groups to achieve solutions to environmental problems.

### **Learning Through Application**

**UC3.01** – produce a case study of a particular industry or human system (e.g., transportation system) to determine its environmental impact and make recommendations for environmental and economic sustainability;

**UC3.02** – analyse the effects on urban and rural environments of Canada’s dependence on cars and fossil fuels;

**UC3.03** – identify household products that contain hazardous substances and describe ways of reducing their use and encouraging proper disposal;

**UC3.04** – produce a plan to reduce personal levels of consumption;

**UC3.05** – assess the level of risk from natural or human-caused disasters in the local community and identify requirements for personal and community preparedness;

**UC3.06** – predict the major impacts of a selected resource management problem or environmental problem (e.g., tropical deforestation, climate change) on both natural and human systems over the next century.

## **Methods of Geographic Inquiry**

### **Overall Expectations**

**GIV.01** · use geographic skills, methods, and technologies to gather, analyse, and synthesize information on environmental and resource management issues and concerns;

**GIV.02** · use a variety of methods and technologies to communicate the results of geographic inquiry in written, oral, and visual forms;

**GIV.03** · produce a structured plan and conduct an independent inquiry that applies geographic knowledge, skills, methods, and technologies to a selected sustainability and resource management issue;

**GIV.04** · describe careers related to the environment and resource management.

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## Specific Expectations

### Understanding Concepts

- GI1.01** – define and use geographic terms correctly in written and oral communication (e.g., *region, pattern, system, interdependence, rural, urban, wilderness, ecology, biodiversity, succession, biotic, abiotic, adaptation, optimal conditions*);
- GI1.02** – define and use terms associated with the environment and resource management correctly (e.g., *global commons, carrying capacity, ecological footprint, sustainable development, sustained yield, silviculture*);
- GI1.03** – demonstrate an understanding of the technologies used in geographic inquiry (e.g., remote sensing, geographic information systems, hypermedia, mapping);
- GI1.04** – demonstrate an understanding of the geographic inquiry process;
- GI1.05** – identify careers related to the environment and resource management.

### Developing and Practising Skills

- GI2.01** – analyse how different media (e.g., political cartoons, government reports, advertising, alternative and mainstream periodicals) present the realities and complexities of environmental and resource management issues;
- GI2.02** – explain how information may be biased, and identify the types and sources of information that are relevant to particular inquiries;
- GI2.03** – use graphic organizers (e.g., Venn diagrams, semantic webs, timelines) to analyse and synthesize data;
- GI2.04** – interpret maps showing environmental and resource management concerns on local, regional, national, and global scales;
- GI2.05** – produce original maps, sketches, and/or photographs to illustrate the results of geographic inquiries on environmental and resource management issues;
- GI2.06** – use statistical methods to effectively analyse data related to the environment and resource management;
- GI2.07** – apply geotechnology (e.g., remote sensing, geographic information systems, global positioning systems) effectively to the collection and analysis of data related to environmental and resource management concerns;
- GI2.08** – use field research skills to collect information about environmental and resource management issues;
- GI2.09** – use written, oral, and visual communication skills to present the results of geographic inquiry and analysis effectively.

### Learning Through Application

- GI3.01** – use maps, aerial photographs, satellite images, and geographic information systems to analyse causes and effects of environmental change;
- GI3.02** – synthesize ideas presented in a round-table discussion on a selected environmental issue, make recommendations, and rank possible solutions;
- GI3.03** – develop focusing questions and apply geographic methods and technologies to conduct an independent geographic inquiry on a sustainability or resource management issue (e.g., deforestation, depletion of the ozone layer, soil depletion, loss of biodiversity);
- GI3.04** – present reasoned arguments to defend a position on a sustainability or resource management issue;
- GI3.05** – produce workable guidelines for and develop, as part of a team, an environmental action plan to address a concern or initiate a local environmental improvement project;
- GI3.06** – analyse educational requirements, job descriptions, current opportunities, and future prospects for a selected career related to the environment or resource management.

## Unit 3: Impact Assessment and Environmental Protection: Monitoring Change

**Time:** 25 hours

### Unit Description

Throughout this unit, students identify and explore issues related to the management of the environment and resources at the local, provincial, national, and international levels. Students apply an Environmental Impact Assessment (EIA) template to model ways that environmental or resource management issues may be analysed. Analysis of an international environmental and resource management issue such as air quality lead students to a series of one-on-one debates. Students write a Position Paper on an international environmental issue. Students review and assess the effectiveness of Canadian environmental legislation produced by local, provincial, and federal governments for the sustainability of a specific resource. A summative activity, designed to reinforce the steps of the planning process and how it applies to managing change, will take the form of a student role-playing activity. In this simulation of an arbitration hearing, groups of students represent the major interest groups in a land use dispute over development in the local area. This model may be applied to a local study appropriate to the geographic location of the student. Students continue to add to their Environmental Database.

### Unit Synopsis Chart

Activity	Time	Learning Expectations	Assessment/Evaluation	Tasks
3.1 What is an Issue?	4 hours	GIV.01, UC1.04, GI1.04, GI2.03, GI2.09	Diagnostic (K/U) Formative (T/I) Teacher checklist	Placemat Activity Organizer E.I.A. template brainstorming
3.2 International Environmental and Resource Management Issues	7 hours	UCV.03, GCV.01, GCV.02, GCV.03, UC2.02, UC2.05, GI2.02, GI2.03, GI2.09, GC3.01	Teacher-formative (C/A, T/I) Summative Peer Evaluation Rubric Summative Teacher Rubric	Class discussion Debate Position paper Article summary Graphic organizer
3.3 Local, Provincial and Federal Policy concerning Environmental Issues	7 hours	UCV.02, UCV.03, UCI.03, UC2.01, UC2.02, UC2.03, UC2.05, UC3.05, GI2.07, GI2.08, GI2.09, GI2.04, GI2.05, GI2.06, GI3.01	Diagnostic (K/U) Formative (T/I, C/A) Teacher checklist Summative Teacher Essentials of Geotechnology Rubric	Class discussion Article summary Geotechnologies Gathering/ Analysis Graphic organizer
3.4 Culminating Activity – A Local Study: A Lesson in Impact Assessment and Environmental Protection: A Simulation	7 hours	UCV.01, UC3.01, GI2.09, GI2.05, GI2.03, GI3.01, GI3.02, GI3.03, GIV.03	Teacher Summative Evaluation-Rubric for Presentation Opinion Letter (K/U, T/I, C, A)	Simulation Presentation Letter to Editor

K/U = Knowledge/Understanding    C = Communication    T/I = Thinking/Inquiry    A = Application

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## Activity 3.1: What is an Issue?

Time: 4 hours

### Description

Students review the concept of brainstorming and the definition of what is an issue. Students complete a Placemat activity of environmental and resource management issues. The teacher introduces the steps of an Environmental Impact Assessment (EIA), and the students apply an EIA template to an individual environmental or resource management issue of their choice.

### Strand(s) & Learning Expectations

**Strand(s):** Human-Environmental Interactions, Global Connections

#### Overall Expectations

GIV.01 - use geographic skills, methods, and technologies to gather, analyse, and synthesize information on environmental and resource management issues and concerns.

#### Specific Expectations

UC1.04 - demonstrate an understanding of the purpose and nature of environmental impact assessment studies;

GI1.04 - demonstrate an understanding of the geographic inquiry process;

GI2.03 - use graphic organizers to analyse and synthesize data;

GI2.09 - use written, oral, and visual communication skills to present the results of geographic inquiry and analysis effectively.

### Prior Knowledge & Skills

Students refer to the Culminating Activity 2.7 in Unit 2 and review the relationship between environmental degradation on human health or the impact of an introduced species into an environment.

### Planning Notes

Teachers supply students with a Placemat Activity Sheet (one for every group of 4) Appendix 3.1.1, and a copy of the EIA template Appendix 3.1.2. Supplies of poster paper and markers are required.

### Teaching/Learning Strategies

1. Appendix 3.1.1 can be used for a brainstorming activity known as the Placemat. Transfer the template to large sheets of chart paper. Students should be divided into groups of 4, with the paper centred on the table between them. When the teacher signals the beginning of the activity, each student shall record as many environmental or resource management issues in the quadrant as they can in the allotted time (3 minutes). Each group then compiles a master list of issues as they have defined them. The teacher leads the class in an attempt to define what an “issue” is, and what constitutes an “environmental or resource management issue.” Groups re-evaluate their lists and eliminate all “non-issues,” then group the remaining issues as either “environmental issues” or “resource management issues.” Groups would then briefly share their lists with their classmates.
2. Using a video such as *Environmental Impact Assessment: Process and Potential* have the students develop an EIA template, or use the one provided in Appendix 3.1.2.
3. Each student chooses one ‘issue’ from the Placemat Activity Sheet which must be either an environmental or a resource management issue. Students then use their issue to complete the template.
4. Students refer back to Activities 2.5 and 2.6 and consider the environmental principles initiatives for sustainability, and their implications for the environment and the economy of their issue. A risk assessment and evaluation of the state of disaster preparedness should also be included in the template for each issue.

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5. As part of the debriefing process for this activity, students should be encouraged to evaluate the EIA process by considering the following:
- Can EIA be an effective way of protecting the environment?
  - Can EIA be objective? If not, is this a problem?
  - Are communities given enough chance to be involved in EIA?
  - How can students as individuals become involved in EIA? Do you see this as a worthwhile thing to do? Why or why not?
  - Do you agree with the decisions made in each sample study? Why or why not?
  - Do you think that EIA can make a difference to the decision made?
  - How can the EIA process be improved?
  - What is the role of EIA? Should it address whether specific projects should go ahead, or how they should be developed?

### **Assessment & Evaluation of Student Achievement**

This activity is largely diagnostic and is meant as a review of Unit 2.

The evaluation is formative, with the students submitting their EIA template for a mark.

### **Accommodations**

This activity is group-oriented, which should accommodate the ESL and special education students. Teachers should structure the groups to accommodate these students.

### **Resources**

*Environmental Impact Assessment: Process and Potential*. Classroom Video, CAN 002 009 618

### **Appendices**

Appendix 3.1.1 – Placemat Activity Sheet

Appendix 3.1.2 – Environmental Impact Assessment Template

## **Activity 3.2: International Environmental and Resource Management Issues**

**Time:** 7 hours

### **Description**

The teacher leads a discussion on the issue of global air quality and supplies students with summaries of the Montreal, Rio, and Kyoto Air Quality Protocols. In a timed activity, students working in pairs review and summarize the information into a graphic organizer. Following a teacher-led discussion on the effectiveness of the global air quality initiatives, students complete an inquiry into the impact of air quality controls on either a developed or developing nation. Students stress in their research the need for balance between human needs and environmental protection. Following a series of small group debates on the effectiveness of the international air quality protocols, students submit a two page position paper on an international environmental issue of their choice, evaluating the effectiveness of efforts being made to address global environmental concerns.

### **Strand(s) & Learning Expectations**

**Strand(s):** Human – Environmental Interactions, Global Connections

### **Overall Expectations**

UCV.03 - evaluate a variety of ways to resolve environmental and resource management concerns on the local, regional, and global scale;

GC3.01 - predict the effects of climate change on a selected region of the world;

GCV.01 - analyse environmental and resource management issues on a global scale;

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GCV.02 - analyse the relationships between global population growth, accelerating consumption of resources, and sustainability of ecosystems on a global scale;

GCV.03 - explain the efforts of the international community to deal with environmental and resource management issues and evaluate their effectiveness.

### Specific Expectations

UC2.02 - explain ways to improve the balance between human needs and the protection of natural systems;

UC2.05 - evaluate efforts by individuals and groups to achieve solutions to environmental problems;

GI2.02 - explain how information may be biased, and identify the types and sources of information that are relevant to particular inquiries;

GI2.03 - use graphic organizers to analyse and synthesize data;

GI2.09 - use written, oral, and visual communication skills to present the results of geographic inquiry and analysis effectively.

### Prior Knowledge & Skills

Students research and participate in a debate. Students produce an individual position paper on one international environmental issue. It is assumed that students will have prior experiences in research and debating skills.

### Planning Notes

- The teacher supplies students with summaries of the Montreal, Rio, and Kyoto Air Quality Protocols.
- The teacher supplies students with an Air Quality Protocol graphic organizer Appendix 3.2.1. Teachers will also need copies of the Small Group Debate Appendix 3.2.2; a Peer Evaluation Rubric Appendix 3.2.3; and a Rubric for Supported Position Paper Appendix 3.2.4

### Teaching/Learning Strategies

1. Review/Introduce the Montreal, Rio, and Kyoto Air Quality Protocols. Have students review the summaries in pairs and complete the graphic organizer (Appendix 3.2.1) with the key aspects of each protocol. This is a timed activity of 30 minutes. (Teachers make time adjustments to meet all students needs and abilities.) The teacher should lead class discussion on the Global Issue of Air Quality, and record on poster paper or the blackboard the responses to the following questions:
  - What is the international community doing?
  - How effective have the students been in their efforts?Students record in their notebooks the class consensus on the issue.
2. Students are asked to research the impact of the Air Quality Protocols on either a developed or developing nation stressing the theme of the balance between people and their environment and the need to balance human needs and environmental protection. Students should be aware and identify possible bias in the information on this issue.
3. The teacher organizes a series of small group debates on the issue. Students are divided into groups of three and assigned the letters A, B, or C. There will be a total of three debates during the class, with each student eventually required to argue the affirmative and the negative of the resolution, and to act as a peer evaluator. After each debate, the students should be rotated so that they never debate the same person twice, i.e., all students designated A remain in place while all Bs rotate clockwise and all Cs rotate counter-clockwise.

	<b>Affirmative</b>	<b>Negative</b>	<b>Evaluator</b>
<b>Debate 1</b>	A	B	C
<b>Debate 2</b>	B	C	A
<b>Debate 3</b>	C	A	B

---

The teacher debriefs the debate by asking the class to discuss and draw conclusions from the following questions:

- How can we improve the balance between people and the environment and environmental protection?
  - What are the implications of future technologies?
  - What are the causes and effects of environmental change?
  - What are the international solutions to environmental problems?
  - What changes does the international community have to apply in order to protect the environment?
4. The teacher reviews the concept and production of a Position Paper. Students produce and submit a two-page position paper on an international environmental issue of their choice, evaluating the effectiveness of the efforts being made to address global environmental concerns.

### **Assessment & Evaluation of Student Achievement**

- Pairs organized and class discussion and recording of the conclusions: The focus is to identify the students' ability to understand concepts, and understand the relationship between concepts (international commitments and implementation of the air quality protocols)
- Formative assessment ensuring students are aware of the need to critically analyse research sources.
- Formative evaluation in the form of peer evaluation of the debate Appendix 3.2.3
- Summative teacher assessment of the Position Paper Rubric Appendix 3.2.4

### **Accommodations**

Students in the ESL program may benefit from a mini-lesson that identifies key vocabulary terms for the reading and research activity. Limit the number of language-based resources used in class and focus on the student skills of organizing information correctly.

Accommodations should also be made for students who have difficulty recording and/or synthesizing information. Individuals with these needs could be grouped with students with strong skills. Students may also do an oral presentation for the position paper.

### **Resources**

Chiras, Daniel D., et al. Natural Resource Conservation: Management for a Sustainable Future. 2001. ISBN: 0130333980

WorldWatch Briefing "Buenos Aires Conference on Climate Change Treaty"  
– <http://www.worldwatch.org/alerts/pr981020.html> re: Kyoto Protocol

Rising Sun, Gathering Winds: Policies to Stabilize the Climate and Strengthen

Economies – <http://www.worldwatch.org/pubs/paper/138b.html> re: 'upcoming' Kyoto Protocol

Alternative Fluorocarbons Environmental Acceptability Study (AFEAS), "Montreal Protocol on Substances that Deplete the Ozone Layer," 2000 – [http://www.afeas.org/montreal\\_protocol.html](http://www.afeas.org/montreal_protocol.html)

Environmental Action Timeline – <http://edugreen.teri.res.in/explore/timeline.htm>

United Nations Framework Convention on Climate Change (UNFCCC), "Guide to the Centerpiece of the Rio Earth Summit" – <http://www.unfccc.de/resource/beginner.html>

The European Commission, Kyoto Protocol – <http://europa.eu.int/comm/environment/climat/kyoto.html>

### **Appendices**

Appendix 3.2.1 – Air Quality Protocol Graphic Organizer

Appendix 3.2.2 – Small Group Debates

Appendix 3.2.3 – Peer Evaluation Rubric for One-On-One Debate

Appendix 3.2.4 – Rubric for Supported Position Paper

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### **Activity 3.3: Local, Provincial and Federal Policy concerning Environmental Issues**

**Time: 7 hours**

#### **Description**

The teacher leads a review of the levels of Canadian Government and the process of drafting and enacting legislation as found in the Grade 10 Civics course. Students are supplied with summaries of national, provincial, and local legislation pertaining to the environment and resource management. Students summarize key concepts using a graphic organizer. The teacher reviews basic cartographic principles and the use of geotechnologies, including Geographic Information Systems, satellite maps, and aerial photographs. Students apply geotechnology to the analysis of the impact of environmental and resource management on a rural/urban case study.

#### **Strand(s) & Learning Expectations**

**Strand(s):** Human-Environment Interactions, Understanding and Managing Change

#### **Overall Expectations**

UCV.02 - analyse the purpose and effects of current and evolving environmental legislation and regulations at the local, provincial, national levels;

UCV.03 - evaluate a variety of ways to resolve environmental and resource management concerns on the local, regional, and global scale.

#### **Specific Expectations**

UC1.03 - explain how environmental policies can affect the economy;

UC2.01 - explain selected environmental protection principles and initiatives, and predict their implications for a sustainable environment and economy;

UC2.02 - explain ways to improve the balance between human needs and the protection of natural systems;

UC2.03 - evaluate the implications for the future of developments in selected areas of technology;

UC2.05 - evaluate efforts by individuals and groups to achieve solutions to environmental problems;

UC3.05 - assess the level of risk from natural or human-caused disasters in the local community and identify requirements for personal and community preparedness;

GI2.04 - interpret maps showing environmental and resource management concerns on local, regional, national, and global scales;

GI2.05 - produce original maps, sketches, and/or photographs to illustrate the results of geographic inquiries on environmental and resource management issues;

GI2.06 - use statistical methods to effectively analyse data related to the environment and resource management;

GI2.07 - apply geo-technology effectively to the collection and analysis of data related to environmental and resource management concerns;

GI2.08 - use field research skills to collect information about environmental and resource management issues;

GI3.01 - use maps, aerial photographs, satellite images, and geographic information systems to analyse cause and effects of environmental change.

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## Prior Knowledge & Skills

Students are creating computer-generated maps, but they still need to be reminded of basic mapping conventions and skills (components of a map, use of colour, units in legend, etc.). Students should understand terminology related to the information that is to be mapped. In addition, students need a basic understanding of geotechnologies including satellite images and aerial photographs.

## Planning Notes

The teacher directs student inquiry on the Web to locate and summarize the National, Provincial, and Local environmental legislation. Students may review Grade 10 Civics for information on legislation. Students may access the information on the Web. The teacher supplies students with a Graphic Organizer Appendix 3.3.1. The teacher supplies students with Appendix 3.3.2 – A Resource Management Organizer, Appendix 3.3.3 – Land Use Conflict in The Holland Marsh, and Appendix 3.3.4. – GIS Activity Rubric.

## Teaching/Learning Strategies

1. In pairs, students research and review the Federal, Provincial, and Local Environmental Legislation related to a specific issue, and complete the Environmental Legislation Graphic Organizer Appendix 3.3.1. The teacher leads a discussion of the impact of the environmental legislation by the three levels of government, and the implications for sustainability. How effective is the legislation from each branch of government?
2. Student responses are recorded on poster paper or the board and record the class conclusions in their notebook. Students research the roles and responsibilities of each level of government as they relate to a specific resource management issue in Canada. Issues that might be considered include: sanitary landfills, wind power, logging in provincial or federal parks, developing either a provincial or federal park, expansion of existing gravel quarries. Students summarize their research using a graphic organizer, Appendix 3.3.
3. The teacher debriefs Appendix 3.3.2 by leading a class discussion using the following questions:
  - How do the three levels of environmental policies affect Canada's economy, e.g., job creation, environmental protection, and sustainability of resources?
  - What are the implications of future technologies on Canada's environment and resources?
  - Identify and evaluate the effectiveness of groups that have specific interests in protecting and promoting a sustainable economic environment for Canada.
  - Students record in their notebook the class consensus on the issues.
4. The geo-technology activity, Appendix 3.3.3 as a suggested example, focuses on the use of Geographic Information Systems and satellite imagery to analyse land-use conflict. Depending on the abilities and background of the students, the teacher may find it necessary to review basic cartographic principles, and the fundamentals of G.I.S. and satellite image analysis.
  - As an introduction, the teacher provides a brief overview of the geographic, historic, and economic significance of selected land-use conflicts in other Ontario locations that are available on *Atlas of Ontario Program CD*.
  - Students use the Ministry-licensed software, ArcView 3.2 and data and shapefiles from *ArcCanada* and the *ATLAS of Ontario Program* CDs to complete the activity.
  - The sample (generic) geotechnology activity Appendix 3.3.3 – Land Use Conflict in the Holland Marsh, is assessed using Appendix 3.3.4. This model could also be applied to other land-use examples in Ontario.

**Note:** If teachers do not have access to computers for this activity, students can be provided with print copies of the images and maps necessary to complete this activity.

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## Assessment & Evaluation of Student Assessment

Formative teacher assessment of graphic organizers

Summative teacher assessment of the geotechnology activity

### Accommodations

- For exceptional students, review the student's IEP and determine if particular accommodations are required. Organize pairs so that students with strong skills can complement students who may experience difficulties.
- If students' writing skills are weak, they may orally communicate the research in front of their class, once the teacher has reviewed the information.

### Resources

'Sustainable Solutions,' *The Nature of Things*. CBC Video. #wof89-07 48

Environment Canada – [www.ec.gc.ca/eco/main\\_e.htm](http://www.ec.gc.ca/eco/main_e.htm)

Government of Ontario – [www.gov.on.ca](http://www.gov.on.ca)

"Neglecting Mother Nature." *Canada and the World Backgrounder*. March 1998. p. 22-23.

*The Atlas of Ontario Program*. 2001 ESRI Canada. 2001

MapRelections – <http://plasma.ycas.yorku.ca/mapref/>

### Appendices

Appendix 3.3.1 – National, Provincial, and Local Environmental Legislation Graphic Organizer

Appendix 3.3.2 – Resource Management Issue: Graphic Organizer

Appendix 3.3.3 – Land Use Conflict in the Holland Marsh

Appendix 3.3.4 – GIS Activity Rubric

## Activity 3.4: Culminating Activity: A Local Study: A Lesson in Impact Assessment and Environmental Protection: A Simulation

**Time: 7 hours**

### Description

Students are now in a position to analyse a number of factors that contribute to human and environmental interaction, and have an understanding of the process of managing change. Students participate in a role-playing simulation based on a development application for a sensitive environmental area. In the simulation, students represent the major interest groups concerned with the debate. A public hearing is to be held where representatives of the groups present their arguments with evidence to support their views to an arbitration panel, made up of their peers. The student arbitration panel submits a decision. In response to the decision of the arbitration panel, students write an individual reaction in the form of a Letter to the Editor from the point of view of their group, which is submitted for assessment. As a wrap-up to this unit, a class discussion is held focussing on the effectiveness of the arbitration process in protecting natural environments.

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## **Strand(s) & Learning Expectations**

**Strand(s):** Human-Environment Interaction, Understanding and Managing Change

### **Overall Expectations**

UCV.01 - evaluate the impact of economic, social, political, and technological change on natural environments;

HEV.01 - demonstrate an understanding of how humans are in an integral part of an ecological system and how human activity has short-and long-term effects on the natural environment;

HEV.02 - analyse and evaluate interrelationships between the environment, the economy, and society.

### **Specific Expectations**

GI2.03 - use graphic organizers to analyse and synthesis data;

GI2.05 - produce original maps, sketches, and/or photographs to illustrate the results of geographic inquiries on environmental and resource management issues;

GI3.01 - use maps, aerial photographs, satellite images, and geographic information systems to analyse causes and effects of environmental change;

GI3.02 - synthesize ideas presented in a round-table discussion on a selected environmental issue, make recommendations, and rank possible solutions;

GI3.03 - develop focusing questions and apply geographic methods and technologies to conduct an independent geographic inquiry on a sustainability or resource management issue.

### **Prior Knowledge & Skills**

Students will have the opportunity to apply the skills and knowledge that they have acquired throughout Unit 3.

### **Planning Notes**

- The teacher prepares background material for student use on the area to be studied. These should include:
  - a description of the area, its features and its environmental significance
  - a description of the environmental problem
  - a brief outline of the position of stakeholders
  - suggestion about where to find further information (press, periodicals, websites, etc.)
- The teacher prepares Appendix 3.4.1 – A Local Study Simulation, Appendix 3.4.2 – Supported Opinion Letter to the Editor.

### **Teaching/Learning Strategies**

1. The students are provided with overview materials describing the local area to be studied and the issues related to development. (See Planning Notes.) Relevant websites are provided for further research. Students submit a précis of the articles to the teacher for assessment.
2. Groups research their roles for the simulation, prepare briefs, and develop presentation materials (visuals).
3. A Public Hearing is held and the Arbitration Panel announces its decision.

- 
4. The teacher debriefs this activity by leading a discussion based on the following questions:
- Prepare a chart to summarize the arguments that your opponents used to state their positions on this issue.
  - Which of the opposing viewpoints did you find most convincing? Give reasons.
  - Which of the opposing viewpoints did you find the least convincing? Give reasons.
  - Did you agree with the decision of the Arbitration Panel? Why or why not?
  - If you were in the position to make the final decision on this issue, what would you decide?
  - Many issues are solved through the arbitration process. Is this an effective way to solve disputes over environmental issues? Explain your answer.

Students submit, for assessment, a response to the Arbitration Panel based on the point of view of their group. This takes the form of a Letter to the Editor.

### **Assessment & Evaluation of Student Achievement**

- This activity is largely summative and is meant as a review of Unit 3.
- The assessment is summative using supported Opinion Letter to the Editor Rubric Appendix 3.4.2.

### **Accommodations**

- Adapt articles for student use; include word lists.
- Organize groups so that students with strong skills can complement students who may experience difficulties.

### **Resources**

A variety of articles from the local and national press as well as relevant websites should be identified.

Ontario Municipal Board – [www.omb.on.ca](http://www.omb.on.ca)

Ontario Municipal Board. *Your Guide to the Ontario Municipal Board*. Queen's Printer for Ontario. (1994) ISBN 0-7778-1589-3

“Urban Growth.” *The Nature of Things*. CBC Video #wof93-04

“Lost in the Suburbs.” *The Nature of Things*. CBC Video #wof97-04

### **Appendices**

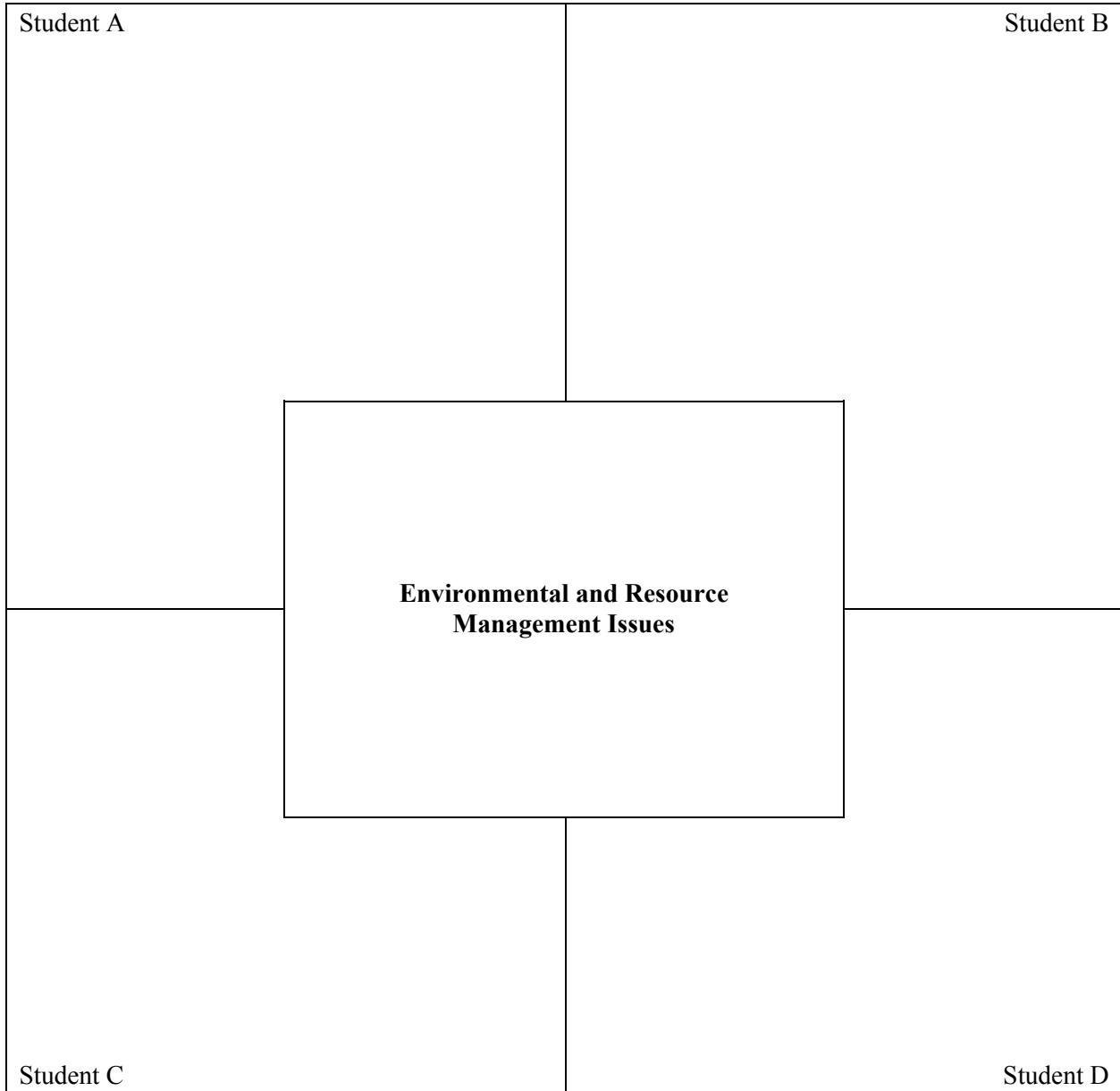
Appendix 3.4.1 – A Local Study: A lesson in Impact Assessment and Environmental Protection:  
A Simulation

Appendix 3.4.2 – Supported Open Letter to the Editor Rubric

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**Appendix 3.1.1**

**Placemat Activity Sheet**



## Appendix 3.1.2

### Environmental Impact Assessment Template

“Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.”

(Declaration Principle 17 - Earth Summit, Rio de Janeiro, 1992).

Applying EIA successfully in environmental management depends on the commitment of developers and decision-makers, and the involvement of communities.

Choose one Environmental or Resource Management issue for analysis. Do an Environmental Impact Assessment of the issue using the eight steps listed below:

**Issue:** \_\_\_\_\_

Steps	Principles	Specific Examples
Step 1: Initiate Project	<ul style="list-style-type: none"> <li>present idea for project</li> <li>decide what type of EIA must occur</li> </ul>	
Step 2: Identify Issues	<ul style="list-style-type: none"> <li>gather information from all parties</li> <li>Government</li> <li>Community</li> <li>Developer</li> </ul>	
Step 3: Develop Alternatives	<ul style="list-style-type: none"> <li>consider all alternatives</li> <li>site</li> <li>design technologies to reduce impact</li> <li>‘do nothing’: options</li> </ul>	
Step 4: Predict Impacts	<ul style="list-style-type: none"> <li>positive impacts</li> <li>negative impacts</li> </ul>	
Step 5: Analyse Impacts	<ul style="list-style-type: none"> <li>determine best solution</li> </ul>	
Step 6: Report Findings	<ul style="list-style-type: none"> <li>formal report: Environmental Impact Statement</li> </ul>	
Step 7: Make a Decision	<ul style="list-style-type: none"> <li>decision made, usually by some level of government</li> </ul>	
Step 8: Monitoring	<ul style="list-style-type: none"> <li>project must be monitored to evaluate success of EIA, and to determine if changes need to be made to either the project or future proposals</li> </ul>	

## Appendix 3.2.1

### Air Quality Protocol Graphic Organizer

Montreal Protocol	Rio Protocol	Kyoto Protocol
Key Aspects	Key Aspects	Key Aspects
Effects	Effects	Effects

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## Appendix 3.2.2

### Small Group Debates

#### Debate Topic

Be it resolved that: “International Air Quality Protocols have been successful in balancing global environmental protection and human needs.”

<b>Name:</b>	<b>Name:</b>
Affirmative Speaker (6 minutes)	Negative Speaker (6 minutes)
Evaluator records the most significant arguments below.	Evaluator records the most significant argument below.
<b>Rebuttal (3 minutes)</b>	<b>Rebuttal (3 minutes)</b>
Evaluator records each successful rebuttal below.	Evaluator records each successful rebuttal below.
Summation (2 minutes)	Summation (2 minutes)

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### Appendix 3.2.3

#### Peer Evaluation Rubric for One-on-One Debate

(Formative Assessment)

Criteria	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)
<b>Understanding/ Knowledge</b> of the topic being debated/ supporting arguments	- displays limited understanding of the topic supported the arguments with very few relevant facts or with irrelevant facts	- displays some understanding of the topic supported arguments with some relevant facts	- displays considerable understanding of the topic supported arguments with relevant facts	- displays thorough understanding of the topic supported arguments with many relevant facts
<b>Thinking/ Inquiry</b> quality of rebuttal	- rebuttal is mostly ineffective	- rebuttal is somewhat effective	- rebuttal is effective	- rebuttal is highly effective
<b>Communication</b> (Oral)	- communicates orally with limited effectiveness	- communicates orally with some effectiveness	- communicates orally with considerable effectiveness	- communicates orally with a great deal of effectiveness
<b>Application</b>	- knowledge previously gained is transferred to the debate with limited effectiveness	- knowledge previously gained is transferred to the debate with moderate effectiveness	- knowledge previously gained is transferred to the debate in an effective manner	- knowledge previously gained is transferred to the debate in a highly effective manner

**Note:** A student whose achievement is below Level 1 (50%) has not met all the expectations for this assignment or activity

Student Name:  
Overall Level:  
Comments:

Evaluator Name:  
Strengths:

## Appendix 3.2.4

### Rubric for Supported Position Paper

(Assessment of Student Work)

Criteria	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)
<b>Knowledge/ Understanding</b> Understanding of the environmental issues GCV.02, GCV.03	- demonstrates a limited understanding of the issues	- demonstrates some understanding of the issues	- demonstrates a considerable understanding of the issues	- demonstrates a high degree of understanding of the issues
<b>Thinking/ Inquiry</b> Use of critical thinking skills to evaluate solutions to environmental problems VC2.02, VC2.05	- applies creative thinking skills in writing a position paper with limited effectiveness	- applies creative thinking skills in writing a position paper with moderate effectiveness	- applies creative thinking skills in writing a position paper with considerable effectiveness	- applies creative thinking skills in writing a position paper with a high degree of effectiveness
<b>Communication</b> Communicates information through writing GI2.02	- communicates information through writing a position paper with limited effectiveness	- communicates information through writing of the position paper with some effectiveness	- communicates information through writing of the position paper with clarity	- communicates information through writing of a position paper with a high degree of clarity
<b>Application</b> uses information to suggest and evaluate solutions to environmental problems GI2.02, GI2.03	- shows limited insight in applying findings to the issues	- shows some insight in applying findings to the issues	- demonstrates good insight in applying findings to the issues	- clearly and creatively shows insight in applying findings to the issues

**Note:** A student whose achievement is below Level 1 (50%) has not met the expectations for this assignment or activity.

Student Name:

Comments:

Areas to Review Next Steps:

Overall Level:

Strengths:

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### Appendix 3.3.1

#### National, Provincial and Local Environmental Legislation Graphic Organizer

Issue: \_\_\_\_\_

	<b>Federal</b>	<b>Provincial</b>	<b>Local</b>
Legislation details			
Evaluate the effectiveness of the legislation			
Implications for Sustainability for the Environment			
Implications of Sustainability for Resource Management			

### Appendix 3.3.2

#### Resource Management Issue Graphic Organizer

Issue: \_\_\_\_\_

	<b>Federal</b>	<b>Provincial</b>	<b>Local</b>
Effectiveness of the Legislation			
Implications for Sustainability of the Specific Resource Management Issue			

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### Appendix 3.3.3

#### Land Use Conflict in the Holland Marsh (Generic Example)

The Holland Marsh of south-central Ontario is an area of intensive agriculture. As a result of housing developments, it is also an area that is also experiencing increasing pressures from urban growth. To preserve the Holland Marsh in its current state, it will be necessary to develop and implement an urban growth plan.

The student assumes the role of an urban planner hired by the Town of Newmarket. The task is to develop a sustainable development plan for the Holland Marsh and its surrounding area. Each student generates a report that defines the existing area of the Holland Marsh, identifies the areas where significant urban encroachment exists, and makes suggestions as to how these problems can be resolved. The final report must include annotated maps, and must outline a clear plan for a sustainable future.

#### Tasks

1. Open the image file and the feature data for the Holland Marsh from the Atlas Ontario CD-ROM.
2. Create a new polygon to define the area of the Holland Marsh.
3. Compare the road patterns on the image captured in 2001 with the road patterns in the feature data mapped ten years earlier. Describe the patterns of urban growth that you observe. Speculate as to why development has occurred as it has.
4. Conduct an inquiry to determine the populations of Newmarket and Bradford. Determine the area of these two communities by creating new polygons on the image, then calculate their population densities.
5. The sizes and shapes of the lots on the concession roads surrounding the Holland Marsh are quite different from those observed on the marsh itself. Give reasons for the differences.
6. One way to change patterns of urban growth is to re-route traffic. Identify specific roads that could be re-routed, and create a new theme(s) to show your proposed changes.
7. Carefully observe the drainage patterns in the area. How can you distinguish between rivers that occur naturally and drainage ditches which are man-made (made by humans)? How would the drainage patterns impact upon your plans for future development?

## Appendix 3.3.4

### Global Information Systems Rubric for Assessment of Case Study

Criteria	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)
<b>Knowledge/ Understanding</b> Demonstrates knowledge of impact of legislation on environment VCV.02, VCV.03	- little understanding of relationships between key concepts was evident	- some understandings of relationships between key concepts was evident	- considerable understanding of relationships between key concepts was evident	- thorough understanding of relationships between key concepts was evident
<b>Communication</b> Map design and conventions used to demonstrate concepts GI2.04, GI2.05	- a few map essentials are present in the layout	- some of the map essentials are used in the layout	- most of the essentials are present in the layout	- all map essentials are present in the layout
<b>Thinking/Inquiry</b> Demonstrates an effective and appropriate use of GIS software to perform simple analytical operation GI2.06, GI2.07	- few of the specific operations necessary to perform an analysis have been accomplished	- some of the specific operations necessary to perform an analysis have been accomplished	- most of the specific operations necessary to perform an analysis have been accomplished	- all of the specific operations necessary to perform an analysis have been accomplished
<b>Application</b> Synthesis or Conclusion drawn from data VC2.01, VC2.03, VC2.05	- conclusions, predictions and/or connections were made with limited clarity and logic	- conclusions, predictions and/or connections were made with some clarity and logic	- conclusions, predictions and/or connections were made with considerable clarity and logic	- conclusions, predictions and/or connections were made with a high degree of clarity and logic

**Note:** A student whose achievement is below Level 1 (50%) has not met the expectations for this assignment or activity.

Student Name:  
Comments:  
Areas to Review:

Overall Level:  
Strengths:  
Next Steps:

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## **Appendix 3.4.1**

### **A Local Study: A Lesson In Impact Assessment and Environmental Protection: A Simulation**

#### **Simulation Problem**

The Ontario Municipal Board has called in a panel of arbitrators to make a decision on whether or not to approve development on the selected site. It has called a public hearing where the various interest groups can voice their opinions.

In this simulation students play the roles of participants involved in the debate over the development of the local area. At the hearing, each group presents its arguments and evidence to support its point of view, followed by the Arbitrator's decision. The class discusses the effectiveness of the arbitration process and submit a response to the arbitration decision through a letter to the editor.

**Interest Groups** presenting arguments at the meeting include:

- Developers
- Local Governments
- Ontario Government – Ministry of Municipal Affairs and Housing, and the Ministry of the Environment
- Local residents
- Environmental Agencies (Non-governmental Organizations - NGOs)

Interest Group Instructions:

- Groups will research the issues in role.
- Prepare their brief/presentation – must include visuals (Each presentation should be no more than 15 minutes in length).

#### **Arbitration Panel**

Your job will be to:

- prepare background research that appreciates all viewpoints;
- hear all arguments, analyse the situation, and make a decision that considers all factors;
- prepare a final report that explains your decision based on present and future considerations;
- use formal and legal language – this is a formal hearing.

## Appendix 3.4.2

### Supported Opinion Letter to the Editor Rubric

Categories	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)
<b>Knowledge/ Understanding</b> Quality of Information to Support Opinion OCV.01	- limited information included to support the opinion	- some information included to support the opinion	- considerable information included to support the opinion	- a high level of information included to support the opinion
<b>Knowledge/ Understanding</b> Relevance and Accuracy of Information selected OCV.02	- demonstrates limited knowledge of relevant information	- demonstrates some knowledge of relevant information	- most information was relevant and accurate	- information was relevant to the topic and contained accurate facts
<b>Communication</b> Communication Skills effective use of written work and illustration GI2.03, GI2.05, GI3.01	- written work demonstrated limited clarity	- written work demonstrated some clarity	- written work demonstrated considerable clarity	- written work demonstrated a high degree of clarity
<b>Thinking/Inquiry</b> Critical Thinking Skills to synthesize and focus ideas GI3.02, GI3.03	- critical thinking skills applied with limited effectiveness	- critical thinking skills applied in a moderately effective manner	- critical thinking skills applied in a considerably effective manner	- critical thinking skills applied in a highly effective manner
<b>Application</b> Logic of Opinion based on relationship between the environment, economy and society HEV.02	- opinion demonstrates limited logic	- opinion showed some logic	- opinion showed considerable logic	- opinion showed a high degree of logic

**Note:** A student whose achievement is below Level 1 (50%) has not met the expectations for this assignment or activity.

\* Number of points expected at each level may vary.

Student Name:

Comments:

Overall Level:

Strengths: