



## Socially-based Curriculum Unit: My Eco-Footprint: Human Impact on the Environment

**Unit Title:** My Eco-Footprint: Human Impact on the Environment

**Time Frame:** Five lessons (approx. 4 to 6 classes, depending on homework assigned)

**Unit Developer(s):** Alice Smith

**Developed for Course Name and Course Code:** Civics (CHV2O)

**Strand(s) and Curriculum Learning Expectations Addressed:**

**Informed Citizenship Strand**

**ICV.04** • explain what it means to be a “global citizen” and why it is important to be one.

**IC4.01** – analyse contemporary crises or issues of international significance (e.g., health and welfare, disasters, human rights, economic development, environmental quality, terrorism)

**Active Citizenship Strand**

**ACV.01** • apply appropriate inquiry skills to the research of questions and issues of civic importance

**AC1.02** – organize information, using a variety of methods and tools (e.g., summaries, notes, timelines, visual organizers, maps, comparison organizers)

**AC1.03** – communicate the results of inquiries into important civic issues, using a variety of forms (e.g., discussions and debates, posters, letters to elected officials, Web pages, visual organizers, dramatizations)

**AC2.05** – demonstrate an understanding of their responsibilities as local, national, and global citizens by applying their knowledge of civics, and skills related to purposeful and active citizenship, to a project of personal interest and civic importance (e.g., participating in food and clothing drives; visiting seniors; participating in community festivals, celebrations, and events; becoming involved in human rights, antidiscrimination, or antiracism activities)

### Desired Results

**Unit Description:**

In the Civics course, students examine the concept of “global citizenship.” Further to this, students are expected to engage in some form of action project that demonstrates their understanding of their responsibilities as global citizens.

In this unit, students will complete a quiz that asks them questions that are relevant to their own lives and allows them to assess their impact on the planet’s biosphere. The quiz focuses on four aspects of the students’ lives: diet, home life/shelter, transportation, and lifestyle choices. After completing the quiz students participate in lessons involving a variety of group work and individual activities that address how



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each of these factors affects the environment and what they, as individuals, can do to reduce their impact. At the end of the unit, students will complete a final performance task that will allow them to demonstrate their understanding of how humans affect the environment and encourage others to lessen their impact.

### **Enduring Understandings / Learning:**

- the effect that their lifestyle choices have on the environment
- how to reduce their impact on the environment and hence become better, more responsible, global citizens

### **Assessment Tasks**

#### **Performance Tasks and Other Evidence That Will Demonstrate the Knowledge and Skills Acquired:**

- completion of a mind map
- completion of four graphic organizers (tables)
- completion of a question sheet including graphic organizers (tables)
- class and group discussion
- Final Performance Assessment Task: development of a poster or brochure to help other students learn how to reduce their impact on the environment

#### **Assessment Criteria:**

- students will be assessed according to the four categories of knowledge and skills: Knowledge and Understanding, Thinking, Communication, and Application

### **Unit Planning Notes**

#### **Prior Learning Necessary:**

Students should have already examined the concept of “global citizenship”. Most definitions of global citizenship include some component of environmental stewardship. In this unit students will have an opportunity to evaluate their personal habits with respect to environmental stewardship and reflect on their



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practice as “global citizens.”

### Preparation Notes:

- in order to save paper, the teacher could present the quiz as a Powerpoint™ slide show (in this case a computer, LCD projector, and screen would be needed)
- photocopying of handouts (blackline masters)
- large sheets of newsprint or poster paper (Tree-friendly choice: re-use old student projects by using the backs of the paper/poster board)
- brochure/poster paper
- pencil crayons, markers, paints
- rulers, stencils

## Learning Plan

### Lesson 1: My Eco-Footprint Quiz

#### *Background*

There are many Eco-Footprint quizzes available on the internet. Unfortunately, many of the questions that are asked do not apply to high school students. Most students do not own their own houses or cars. Decisions about home size and appliance, electronic, and vehicle purchases are usually made by the students' parents/guardians. This quiz asks questions that will be relevant to most high school students. The questions also open the door for students to begin to think about ways in which they can reduce their personal ecological footprint through the decisions and choices that they make each day.

*Duration:* Approx. 75 minutes

#### *Materials Required*

- Class set of copies of “My Eco-Footprint Student Quiz” (**Appendix A**)
- Class set of copies of “My Eco-Footprint Student Quiz: Answer Sheet” (**Appendix B**) – two per page – cut in half (to save paper)
- Optional: Overhead transparency of “My Eco-Footprint Student Quiz: Scoring Guide (**Appendix C**) and overhead projector

#### **OR**

- PowerPoint™ slide show “My Eco-Footprint Student Quiz & Scoring Guide”
- Computer



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- LCD projector
- screen
- Class set of copies of “My Eco-Footprint Quiz: Student Answer Sheet” (**Appendix B**)

\* While the second option will save paper, it does require the use of electricity. The electricity usage is somewhat off-set by the savings on paper production and transportation as well as the electricity and toner usage required by a photocopier. Ultimately, you must decide which option best suits you. If you choose to photocopy the quiz, you can reduce your paper usage by saving your class set of quizzes for re-use.

### *Lesson Details*

1. Review the concept of “Global Citizenship” with your class. Ask students, “What are the characteristics of a good global citizen?” If students do not recall environmental stewardship as one of the tenets of global citizenship, be sure to remind them of this critical factor.
2. Ask students, “What is a footprint?” You will likely get responses such as: “an impression in the ground”, “a mark left by a person’s foot”, “a tread mark left by a boot or shoe in the dirt”.
3. Ask students, “Based on your knowledge of what a footprint is, what do you think an “ecological footprint” is?”
4. Review with students some of the following definitions of eco-footprint. You may wish to write one of them on the chalkboard:

#### **An eco-footprint:**

- **measures the amount of natural resources consumed by an individual**
  - **measures an individual’s impact on the natural environment**
5. Explain to students that they are about to complete a quiz that will assess their own personal eco-footprints.
  6. Hand out the “My Eco-Footprint Student Quiz: Answer Sheet” (**Appendix B**)
  7. If you have made a class set of the quizzes (**Appendix A**), distribute them at this time. Otherwise, begin the PowerPoint™ slide show. Read each slide out loud and give the students adequate time to record their answers on the Answer Sheet. Explain to students that it is possible that none of the answers provided for a particular question will fit their situation exactly, but they are to pick the answer that fits their situation most closely.
  8. When students have finished the quiz and recorded all of their answers, either read aloud the scores for each question as listed on “My Eco-Footprint Student Quiz: Scoring Guide” (**Appendix C**) or post them on the PowerPoint™ or an overhead projector. Allow students time to add up their scores and then read aloud the scoring guide interpretations.
  9. You may wish to ask students why they think twenty was the lowest score they could get on the quiz and not zero. The reason for this is that it is virtually impossible to have a “zero” footprint.



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### ***Assessment and Evaluation***

#### *Informal (Formative) Assessment:*

- Teachers can conduct informal assessment of student responses during class discussion.

#### *Formal (Summative) Evaluation:*

- None

#### ***Web-based resources for additional reading and information:***

- Ecological Footprint Quiz: [www.myfootprint.org](http://www.myfootprint.org)
- UBC Survey for Sustainability: <http://www.sustain.ubc.ca/eco-survey/>

### **Lesson 2: Eating and the Earth**

#### ***Background***

Most students have at least some control over their food choices. While their parent(s)/guardian(s) may still be primarily responsible for the household grocery shopping, most students are free to make their own choices regarding lunches and other meals eaten outside the home. Some ecologists have identified changing our diets as one of the simplest things we can do to reduce our impact on the environment. David Suzuki has said that if everyone stopped eating meat for just one day every week, it would make a huge difference. Indeed, factory farming pollutes more than all other sources of industrial pollution combined. Furthermore, many environmentalists are now encouraging people to eat locally-grown food even if it means not buying organic. Obviously, eating locally-grown, organic food is preferable, but if one is forced to make a choice between the two, the environmentally-friendly choice is local over organic (although organic is healthier).

***Duration:*** 75 minutes

#### ***Materials Required***

- large sheets of newsprint or poster paper (Tree-friendly option: re-use old student projects by using the backs of the paper/poster board)
- markers
- Class set of copies of “Meat Production and the Environment” (**Appendix D**) **OR** tree-friendly choice: copy it on to an overhead transparency

#### ***Lesson Details***

1. Divide the students into groups of three or four. Provide each group with a poster paper and marker.
2. Give students the following scenario: “*Your family has decided to order pizza for dinner tonight. You decide on a Hawaiian pizza. Create a mind map showing all of the resources that are required to make and deliver your pizza to your house.*” You may need to review mind mapping with students,



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including drawing a sample mind map on the board. Tell them to put “Hawaiian pizza” in the middle of the page and then draw lines out showing everything that goes into the making of the pizza.

3. Give the students approximately 5 to 10 minutes to work on this. At this point stop the groups and ask each group to share their mind map with the rest of the class. It is likely that most groups will have only included a limited number of resources in their diagrams (i.e. basic ingredients, a delivery car, baking/cooking equipment and utensils, cardboard box).
4. Explain to the class that, for each of those ingredients, a number of other resources were required. For example:
  - pineapple:
  - water
  - seeds
  - sunlight
  - pesticides → petroleum (most pesticides are petroleum based) → oil drilling → refinement → production → shipping → application equipment → safety equipment (if even used!), etc.
  - transportation to store → gasoline → oil → drilling → refinement → truck → truck production → metal → mining, etc.
  - cleaning → water → water treatment → energy to fuel water treatment facilities → pipes to transport water → production of pipes → installation of water pipes, etc.
5. Give students 10-15 more minutes to try and fill in more of the resources that will be required to make their pizza.
6. Have students to present their expanded mind maps to the rest of the class.
7. Ask students: “Did anything you learned in this activity surprise you?” Students will likely respond by saying that they had not thought about all of the resources that go into making something simple like a pizza.
8. Ask students: “What factors make some foods more environmentally friendly than others?” Factors will include: pesticide use, distance traveled, animal vs. plant products.
9. Distribute “Meat Production and the Environment” (**Appendix D**) or project it onto a screen using an overhead projector. Review the diagram with students.
10. Ask students: “Based on this information, which diet would be more environmentally friendly: an omnivorous diet or a vegetarian diet?” Ask students: “Even if people are not prepared to become vegetarians, what could they do to lessen their impact on the environment?”

**\*\*Note:** Some students may express concerns about the level of pesticides in plant foods if they are not eating organic foods. Studies have shown that pesticide concentrations are actually higher in the bodies of people who eat meat than those who do not. This explained by “bio-amplification” (which is discussed in the grade 10 Science curriculum), whereby the pesticides present in the large amount of plant matter eaten by agricultural animals accumulates in their fatty tissue and is passed on to the humans that consume them. It takes many (10 to 20) pounds of feed (often containing pesticides) to produce one pound of meat. Most vegetarians do not eat 10 to 20 pounds of food in one meal – or even in one day - while an omnivore may eat one pound of meat in a meal or over the course of a day.



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### ***Assessment and Evaluation***

#### *Informal (Formative) Assessment:*

- Teachers can observe and comment on student contributions to group work and interactions with other group members.
- Teachers may choose to have groups submit their mind maps for evaluation or assessment.

#### *Formal (Summative) Evaluation:*

- None

#### ***Web-based resources for additional reading and information:***

- “Eating for the earth: Five things you can do”: <http://veg.ca/content/view/134/111/>
- “Meat production’s environmental toll”: <http://veg.ca/content/view/133/111/>
- “Climate Change: The Inconvenient Truth About What We Eat”:  
<http://veg.ca/content/view/136/111/>
- “Connections: Canadian Lifestyle Choices and the Environment”:  
<http://www.ec.gc.ca/soer-ree/English/products/factsheets/95-1.cfm>

### **Lesson 3: Home Life & Transportation**

#### ***Background***

The areas of home life and transportation are the two areas that students have the least amount of control over and this point in their lives. Their parents likely make most of the decisions regarding home purchases/rentals, lighting, appliance purchases and use, and transportation. As such, these areas have been grouped together into one lesson.

***Duration:*** Approx. 60 minutes

#### ***Materials Required***

One copy of each of the following handouts for every FOUR students:

- “Electricity Use in Our Homes” (**Appendix E**)
- “Gas Use in Our Homes & Vehicles” (**Appendix F**)
- “Water Use in Our Homes” (**Appendix G**)
- “Waste Production in Our Homes” (**Appendix H**)

Tree-friendly tip: double-side the handouts when you copy them

OR

Write the headings on the blackboard and have the students create the tables themselves.

#### ***Lesson Details***

1. Divide the students into groups of four.



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2. Distribute one copy of each handout (**Appendices E, F, G, H**) to each group.
3. You may wish to suggest that each student in the group be responsible for recording the group's responses on one sheet. Indicate to students that they will be reporting their group's answers to the class when they are done.
4. Give students approximately 20 minutes to complete this activity.
5. Ask each group to report their ideas to the rest of the class. Go through one sheet at a time (i.e. have all groups report on "Electricity Use in Our Homes" then go on to the next sheet and go through all the groups again).
6. At the end of each session ask students the following questions: "Which ideas would be the easiest to implement?"; "Which ideas would be the most difficult to follow through on and why?"

### ***Assessment and Evaluation***

#### *Informal (Formative) Assessment:*

- Teachers can observe and comment on student contributions to group work and interactions with other group members.
- Teachers can conduct informal assessment of student responses during class discussion.
- Teachers can collect and assess student responses on completed handouts.

#### *Formal (Summative) Evaluation:*

- None

#### ***Web-based resources for additional reading and information:***

- "Eco-tips: Conserving Water": [http://www.treehugger.com/files/2005/06/ecotips\\_conserv.php](http://www.treehugger.com/files/2005/06/ecotips_conserv.php)
- "Tips for Green Living": <http://www.greenpeace.org/canada/en/take-action/greentips>
- Friends of the Earth, "Home Front": [http://www.foe.co.uk/living/poundsavers/home\\_front/index.html](http://www.foe.co.uk/living/poundsavers/home_front/index.html)

## **Lesson 4: Lifestyle Choices**

### ***Background***

North American teenagers spend billions of dollars each year on fast food, clothing, music, movies and cosmetics. Cellular phones are replaced, on average, every 18 months despite the fact that their lifespan may be much longer. Clothing is often made in sweatshops (a human rights issue that can also be connected to the concept of global citizenship) and shipped thousands of miles to consumers in North America. Everything we consume increases our impact on the natural world. In this lesson students will think about the choices they make on a daily basis and brainstorm ways they can reduce their personal impact on the environment.

***Duration:*** Approx. 30 minutes





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### ***Materials Required***

- Class set of copies of “Choices and Consequences” (**Appendix I**)

### ***Lesson Details***

1. Distribute one copy of “Choices and Consequences” (**Appendix I**) to each student. Alternately, you can write the questions on the blackboard and have students copy them down. Give students approximately 15 minutes to complete their sheets.
2. The following can be done in full-class discussion or in smaller groups: Ask each student to pick one item they discussed on the paper and report to other student in the class/group what the effects of the purchase were and how they can reduce the environmental effects of such a purchase in the future.

### ***Assessment and Evaluation***

#### *Informal (Formative) Assessment:*

- Teachers can conduct informal assessment of student responses during class/group discussion.
- Teachers can collect and assess the student worksheet

#### *Formal (Summative) Evaluation:*

- None

## **Lesson 5: Final performance assessment task “Get the word out!”**

### ***Background***

In this lesson students will be pulling together everything they have learned throughout the unit and demonstrating their understanding by completing a summative task. The task requires students to create a print document (poster or brochure) to encourage other students to make responsible environmental choices.

***Duration:*** Approx. 75 – 150 minutes (students may do this in class and/or for homework)

### ***Materials Required***

- Class set of copies of “Get the Word Out!” (**Appendix J**)
- poster paper (students may supply their own)
- plain white photocopy paper (for students doing brochures)
- markers, pencil crayons, paints, rulers, stencils, etc.

### ***Lesson Details***

1. Give each student a copy of “Get the Word Out!” (**Appendix J**).
2. Read through the assignment sheet to ensure that all students understand what is expected of them.
3. Provide students with an opportunity to work on the project in class and/or assign it for homework.



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### ***Assessment and Evaluation***

#### *Informal (Formative) Assessment:*

- Teachers can evaluate student work habits during class.

#### *Formal (Summative) Evaluation:*

- Teachers can evaluate the completed project (“Get the Word Out!”) using the rubric provided on the assignment sheet (**Appendix J**).

### **Appendices**

- Appendix A: “My Eco-Footprint Student Quiz”
- Appendix B: “My Eco-Footprint Student Quiz Answer Sheet”
- Appendix C: “My Eco-Footprint Student Quiz: Scoring Guide”
- Appendix D: “Meat Production and the Environment”
- Appendix E: “Electricity Use in Our Homes”
- Appendix F: “Gas Use in Our Homes and Vehicles”
- Appendix G: “Water Use in Our Homes”
- Appendix H: “Waste Production in Our Homes”
- Appendix I: “Choices and Consequences”
- Appendix J: “Get the Word Out!”
- PowerPoint™ file: “My Eco-Footprint Student Quiz & Scoring Guide”

### **Other Possible Course Applications**

This unit could be used in any of the following courses. The only modification that may be required would be to eliminate the discussion on “global citizenship” as this is not a central concept in these courses.

- Science, Grade 10, Applied (SNC2P)
- Science, Grade 10, Academic (SNC2D)
- Physical Geography: Pattern, Processes, and Interactions, Grade 11, University/College Preparation (CGF3M)
- Canadian and World Issues: A Geographic Analysis, Grade 12, University Preparation (CGW4U)
- World Geography: Human Patterns and Interactions, Grade 12, University Preparation (CGU4U)
- The Environment and Resource Management, Grade 12, University/College Preparation (CGR4M)
- The Environment and Resource Management, Grade 12, Workplace Preparation (CGR4E)