Introduction

Land use involves the management of changes to the natural environment. This is different from settlement, which is the act of inhabiting an area and establishing a community. With this field-based lesson plan, students will come to understand the differences between these two concepts and how both land use and settlement can be achieved sustainably through a series of interrelated activities. In some cases, the city of Peterborough, Ont., is provided as an example, however the activities can be adapted such that students can analyze a city of their choice. Students will also learn different ways of conducting field research in an urban setting and analyzing field data.

Learning Objectives:

• Students will distinguish between physical/topographical maps and street maps.

• Students will be familiarized with different perspectives of urban geography and the roles of individuals versus organizations in shaping communities.

• Students will learn to think critically about businesses and agencies and their ability to operate sustainably and promote environmental stewardship within a community.

• Students will gain an understanding of urban fieldwork.

Grades:

7-8

Examples of Links to Canadian Standards for Geography:

Geographic Skill 1: Asking Geographic Questions

1. Identify geographic issues, define geographic problems and pose geographic questions.

Geographic Skill 2: Acquiring Geographic Information

1. Use a variety of research skills to locate and collect geographic data.

Geographic Skill 3: Organizing Geographic Information

1. Prepare various forms of diagrams, tables and charts to organize and display geographic information.
Activity 1 - Physical Maps Versus Street Maps

**GRADE 7**

**Materials:**
Physical map of the city or town in which you live and a street map of the city or town that your school is located in.

**Example:**
Physical Map of Peterborough

**Assessment:**
Students will look at the physical map and compare it to the street map. They will identify areas that have businesses, schools, parks and homes and relate it to the landform map of the area.

**GRADE 8**

**Materials:**
Data on land use and settlement patterns and economic diversity within Canada.

**Example:**
Street Map of Peterborough City Wards

**Assessment:**
Students will identify the various types of settlement patterns and then determine the settlement patterns within their area.

Students will also identify the economic diversity within Canada and within their area (Where are businesses located? Is there low-income housing in a particular area? Are there executive-style homes?).
## Activity 2 - Sustainable Organizations

### Materials:
Information on sustainability practices in your area and computers for research.

### Example:
A list of Peterborough businesses, community partners and local government agencies can be found on page 7 and the template to record information can be found on page 8.

### Assessment:
Students will research different organizations within their area that are working towards a greener environment.

## Activity 3 - Interview with Sustainable Organizations

### Materials:
Students will be armed with questions based on their research from the previous activity.

### Example:
Examples of questions can be found on page 8.

### Assessment:
Invite community partners into the classroom to talk to students about local efforts to green their community.
## Activity 4 - Accessibility and Pollution

**GRADE 7/8**

<table>
<thead>
<tr>
<th>Materials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Gloves</td>
</tr>
<tr>
<td>• Trash Bags</td>
</tr>
<tr>
<td>• Recycling Bags</td>
</tr>
<tr>
<td>• Clipboards</td>
</tr>
<tr>
<td>• Pencils</td>
</tr>
<tr>
<td>• Tally Chart Template (Page 9)</td>
</tr>
<tr>
<td>• Map of their area</td>
</tr>
</tbody>
</table>

**Example:**
In order for this to work effectively, all students will participate and be assigned specific tasks to complete.

All collection will take place on the same day at the same time in order to not skew the data. For example, if a school has eight grade 7 and 8 classes, they will be able to break the city down into areas and assign them to different groups, with teachers supervising particular areas.

**Assessment:**
Divide the neighbourhood into multiple sections and separate students into groups of five. Students will be assigned particular areas to walk through and make notes, while collecting any litter that they may find in the area. They will note the type of litter that they find and where it comes from. Students will also note how many houses/businesses are in the area, make an estimate of the economic diversity of the area, and note how many trash cans and recycling cans are located in their area that are accessible. Make note of the number of vehicles that drive by, as well as bikes. Are there bike lanes in the area? Are sidewalks available on both sides of the street?
Activity 5 - Data Analysis

GRADE 7/8

Materials:
- Collected Data
- Computers – use Google Charts
- Calculators
- Tally Chart Template (Page 9)
- Sustainability Data Organization Form (Page 10)
- Sustainability Data Rubric (Page 11)

Assessment:
Students will organize, graph and analyze the data from the various areas. What conclusions can be drawn from the data collection? What else would you like to know?

Activity 6 - Getting To Know An Urban Planner

GRADE 7/8

Materials:
Presentation of combined information and questions that arose from their research.
- Tally Chart Template (Page 9)
- Sustainability Data Chart (Page 10)
- Sustainability Data Rubric (Page 11)

Assessment:
If possible, schedule a trip to city hall with an urban planner. Alternatively, invite an urban planner to the school to speak with the students. Have students present the urban planner with their findings and ask the questions that arose from their audit.
Activity 7 -
Writing a Report

GRADE 7/8

Materials:
• Sustainability Report and Rubric (Page 12)
• Computers

Assessment:
Students will each be provided with a copy of their findings on Google docs. They will then write a report using their findings as well as information that they have garnered from the various stages of research and people that they have had the opportunity to meet to determine the level of sustainability within the city. Drawing conclusions about the different areas of the city and how “green” it is. Does landform have anything to do with where litter was found? Are there any businesses whose litter was found more frequently than others? Was it area specific?

Activity 8 -
Writing a Letter

GRADE 7/8

Materials:
• Letter and Rubric (Page 13-14)
• Computers

Assessment:
Students will write a letter about their findings to be shared with community groups, the school board and the local newspapers.
List of Peterborough city and county community partners and local government agencies

- B!KE
- By the Bushel Community Food Cooperative
- Camp Kawartha
- City of Peterborough
- City of Peterborough Waste Management
- Community Foundation of Greater Peterborough
- Community Opportunity and Innovation Network (COIN)
- County of Peterborough
- Curve Lake First Nation
- Farms at Work
- Fleming College
- Greenup
- Hiawatha First Nation
- Kawartha Land Trust
- Kawartha World Issues Centre (KWIC)
- Lansdowne Place
- New Canadians Centre Peterborough
- Peterborough Downtown Business Improvement Area
- Peterborough Immigration Network
- Peterborough Regional Farmers Network
- Township of Asphodel-Norwood
- Township of Cavan Monaghan
- Township of Douro-Dummer
- Township of Havelock-Belmont-Methuen
- Township of North Kawartha
- Township of Otonabee-South Monaghan
- Township of Selwyn
- TRACKS
- Trent University
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What does the partner or agency do?</td>
<td></td>
</tr>
<tr>
<td>What are the partner’s or agency’s main objectives?</td>
<td></td>
</tr>
<tr>
<td>How does the partner or agency contribute to a “greener” urban area?</td>
<td></td>
</tr>
<tr>
<td>Where is the partner or agency located?</td>
<td></td>
</tr>
<tr>
<td>In your opinion, is the partner or agency successful in its objective of environmental stewardship and sustainability? Why or why not?</td>
<td></td>
</tr>
<tr>
<td>List three questions that you want to know more about from this partner or agency.</td>
<td>1.</td>
</tr>
<tr>
<td></td>
<td>2.</td>
</tr>
<tr>
<td></td>
<td>3.</td>
</tr>
</tbody>
</table>
# LAND USE, SETTLEMENT AND SUSTAINABILITY

**Tally Chart Template**

<table>
<thead>
<tr>
<th>Designated Street Section</th>
<th>Person Recording</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enumerator # 1 (land use)</td>
<td>Enumerator # 2 (garbage cans, recycling bins, vehicles)</td>
</tr>
<tr>
<td>Collectors (trash/recycling) <em>Do not pick up anything that is sharp or potentially dangerous!</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of residential properties</th>
<th>Number of commercial properties</th>
<th>Number of industrial properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apartment buildings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Townhouses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of recreational properties</td>
<td>Number of parks</td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>Are there sidewalks on both sides of the street?</td>
<td>Are there bicycle paths?</td>
<td>Are there walking trails?</td>
</tr>
<tr>
<td>One</td>
<td>Both</td>
<td>None</td>
</tr>
<tr>
<td>Number of garbage cans available for use</td>
<td>Number of recycling bins available for use</td>
<td>Are there composting sites?</td>
</tr>
<tr>
<td>What landforms are in your assigned area?</td>
<td>What is the economic diversity of the assigned area?</td>
<td>Number of vehicles on the street</td>
</tr>
<tr>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Moving</td>
<td>Parked</td>
<td>Bikes</td>
</tr>
<tr>
<td>How have landforms in your area been changed?</td>
<td>How have landforms in your area been changed?</td>
<td>How have landforms in your area been changed?</td>
</tr>
<tr>
<td>Garbage collected (specify where it is from - e.g., McDonald's, Tim Hortons)</td>
<td>Recycling collected (specify where it is from - e.g., McDonald's, Tim Hortons)</td>
<td>Items that were unsafe to pick up (specify what you found)</td>
</tr>
</tbody>
</table>
Sustainability Data Organization Form

Now that we have conducted our survey, it is time to organize and analyze all of the data. In your groups, divide up the workload.

Use available graphing software (e.g., Sketch Pad, Microsoft Word) to graph the data that you have found.

1. Using a pie chart, graph the land use data and consider which land use types are more or less common in your neighbourhood.

2. Use a column chart to compare the number of recycling receptacles on city streets to the amount of recycling you picked up in each area.

3. Use a second column chart to compare the number of waste receptacles on city streets to the amount of garbage that you gathered in each area.

Use a pie chart to graph the amount of garbage collected from each company (e.g., McDonald’s, Tim Hortons) as a percentage of the whole.

What do you notice about your graphs?

_____________________________________________________________________

What conclusions can be drawn from each of these graphs?

_____________________________________________________________________

How does this information relate to sustainability in your city?

_____________________________________________________________________

What else would you like to know? List at least five questions, focusing on inquiry and analysis.

1. ____________________________________________________________________

2. ____________________________________________________________________

3. ____________________________________________________________________

4. ____________________________________________________________________

5. ____________________________________________________________________

*Be sure to share all information with all other members in your group and your teacher.*
# Sustainability Data Rubric

**Group Members:**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>All graphs and charts are properly created with titles, labels and scales.</td>
<td>One graph or chart is properly created with titles, labels and scales.</td>
<td>Two or three graphs and charts are properly created with titles, labels and appropriate scales.</td>
<td>Four graphs and charts are properly created with titles, labels and appropriate scales.</td>
<td>All graphs and charts are properly created with titles, labels and appropriate scales.</td>
</tr>
<tr>
<td>Students draw reasonable conclusions from the data.</td>
<td>Students are beginning to draw conclusions from the data that are somewhat reasonable.</td>
<td>Students draw three or four reasonable conclusions from the data.</td>
<td>Students draw numerous reasonable conclusions from the data and attempt to link it to sustainability.</td>
<td>Students draw numerous reasonable conclusions from the data and extend them to link to the level of sustainability in the city.</td>
</tr>
<tr>
<td>Questioning</td>
<td>Students are beginning to ask one or two good questions about the data.</td>
<td>Students ask two to three good questions and are beginning to look for connections to what is being explored.</td>
<td>Students ask three or four good, thoughtful questions derived from the work that they have done.</td>
<td>Students ask five or more good, thoughtful questions derived from the work that they have done.</td>
</tr>
<tr>
<td>Co-operation and communication</td>
<td>Team members rarely work well together. Not everyone has contributed equally to the project.</td>
<td>Team members generally work well together. Everyone has contributed to the project.</td>
<td>Team members work well together. Everyone has contributed equally to the project.</td>
<td>Team members work extremely well together. Everyone has contributed equally to the project.</td>
</tr>
</tbody>
</table>

**Comments:**
Sustainability Report and Rubric - Grade 7

Using your findings from the Field Survey as well as from the various people and groups that you have met and researched, write a report outlining the level of sustainability within the city. Draw conclusions about how “green” different areas of the city are. Do landforms have anything to do with where items were found? Are there any businesses whose litter was found more frequently than others? Was it specific to an area? Do you think changes to the landforms in the area resulted in an increase or decrease of litter?

Your report should be in proper report format and be 2 to 4 pages in length.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information from research is utilized and interpreted in the report.</td>
<td>Information from a limited amount of the research has been used and interpreted in the report.</td>
<td>Half of the information from the research has been interpreted in the report.</td>
<td>Most of the information has been interpreted and included in the report.</td>
<td>All of the information from the research has been interpreted and included in the report.</td>
</tr>
<tr>
<td>Student has included conclusions in the report.</td>
<td>Student attempts to include conclusions in the report.</td>
<td>Student includes two or three reasonable conclusions in the report.</td>
<td>Student includes numerous reasonable conclusions in the report and links it to sustainability.</td>
<td>Student includes numerous reasonable conclusions from the data and links it to the level of sustainability in the city.</td>
</tr>
<tr>
<td>Student has used proper report formatting, terminology and conventions (e.g., title, subheadings, graphs, charts, spelling)</td>
<td>Uses conventions, vocabulary and terminology with limited effectiveness. Report is not formatted correctly.</td>
<td>Uses conventions, vocabulary and terminology with some effectiveness. Report formatting has mostly been followed.</td>
<td>Uses conventions, vocabulary and terminology with considerable effectiveness. Proper report formatting has been followed.</td>
<td>Uses conventions, vocabulary and terminology with a high degree of effectiveness. Proper report formatting has been followed.</td>
</tr>
</tbody>
</table>
Sustainability Letter and Rubric

Using proper formal letter formatting, write a letter based on your findings to share with community groups, the school board and local newspapers. Be sure to use the information and data from your report to support your letter.

Business Letter Format (all lines are left justified)

January 7, 2018

John Smith
President
Environment and Climate Ltd.
1234 Green Road
Kelowna, BC
V1P 1A1
Canada

Re: Study on local land use and sustainability

Dear Mr. Smith,

Thank you for taking the time to read my email describing the results of my study of land use and sustainability practices in my neighbourhood. I am excited about the opportunity to discuss these results with you further and to work with you to bring about positive change in my neighbourhood.

If you require any further information or have any additional questions for me, please do not hesitate to contact me at (111) 222-3333. I look forward to hearing from you.

Sincerely,

Jane Doe
4321 Blue Road
Kelowna, BC
V1P 1A1
Canada
(111) 222-3333
janedoe@xyz.com

Enclosure: report on land use and sustainability in my neighbourhood (2 pages)
## LAND USE, SETTLEMENT AND SUSTAINABILITY

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information from report is utilized to write the letter.</td>
<td>The report was used with limited effectiveness to write the letter.</td>
<td>The report was used with some effectiveness to write the letter.</td>
<td>The report was used with considerable effectiveness to write the letter.</td>
<td>The report was used with a high degree of effectiveness to write the letter.</td>
</tr>
<tr>
<td>Letter communicates appropriately and purposefully with audience.</td>
<td>Letter communicates to audience with limited effectiveness and purpose.</td>
<td>Letter communicates to audience with some effectiveness and purpose.</td>
<td>Letter communicates to audience with considerable effectiveness and purpose.</td>
<td>Letter communicates to audience with a high degree of effectiveness and purpose.</td>
</tr>
<tr>
<td>Student has used proper business letter formatting, terminology and conventions.</td>
<td>Uses conventions, vocabulary and terminology with limited effectiveness. Letter is not formatted correctly.</td>
<td>Uses conventions, vocabulary and terminology with some effectiveness. Letter formatting has mostly been followed.</td>
<td>Uses conventions, vocabulary and terminology with considerable effectiveness. Proper business letter formatting has been followed.</td>
<td>Uses conventions, vocabulary and terminology with a high degree of effectiveness. Proper business letter formatting has been followed.</td>
</tr>
</tbody>
</table>