

Activity 1 Annotated Maps

Description

Students examine sample maps before being introduced to the culminating task of expressing their ideas for mitigating climate change on an annotated map.

Note: The teacher must decide which type of map is best for their students to make. This task recommends having students make their own annotated map, where ideas are communicated on the map itself. However, the students could also use legends to represent their changes and append their explanations in a folder. Another option would be for students to annotate or append their changes onto an already published town or city map. The central idea is that the students are involved in expressing their ideas about the changes they would make to their chosen town or city to address climate change and creatively displaying those changes.

Planning Notes

1. Collect different types of annotated maps for students to examine. Free maps are available at tourist sites, from tourist offices, in museums or art galleries, in the newspaper or magazines. Students can also be asked to bring in different kinds of maps.
2. Photocopy Appendices 1.1 *Effective Map-Making*, 1.2 *Student Task: Town Planning to Address Climate Change*, 1.3 *Town Planning to Address Climate Change: Tips for Getting Started* and 1.4 *Evaluation Rubric* (one for each student).
3. Decide how you will assign communities (Appendix 5.1a) to students.
4. Use samples of student work from past years as exemplars if available.
5. Internet access will be necessary to download information from town and city sites (See Appendix 5.1a).

Teaching/Learning Strategies

1. Ask students to think whether they prefer receiving directions for a destination in the form of a map or as a set of written instructions. Ask them to share their preference and the reason for it with another person.
2. Have the class share some of its responses. Ask why some people might not prefer maps. Ask if they can describe specific qualities that make some maps more user-friendly than others.
3. Distribute three or four samples of maps to students as they work in pairs or small groups. If students have brought maps, have them add these to the collection. Ask them to review the maps and decide which they find to be most effective in communicating information, and why. Ask them to list the three most important criteria for making their selection. As a class, make a list of these criteria on the board.

4. Distribute Appendix 1.1 *Effective Map-Making* to students. Have students read this sheet individually; then, as a class, have students discuss what they think the writer has included as the main criteria for making effective maps. Discuss how these ideas compare with the list on the board.
5. Tell the students that they will be learning about climate change. Their final assignment for the topic will be a) to recommend changes in a community that will address climate change issues and b) to record these recommendations on an annotated map.
6. Distribute Appendix 1.2 *Student Task: Town Planning to Address Climate Change*. Give students time to read on their own and then to clarify their understanding of what is expected with someone sitting next to them. Ask for questions from pairs who require further clarification. Tell them to save this Appendix; they will be referring to it later as they start their planning.
7. Assign — or have each student select — a community to research. (Appendix 5.1a There are 17 communities listed.)
8. Distribute Appendix 1.4 *Evaluation Rubric*. Discuss the criteria listed on the rubric that will be used to assess their completed task:
 - ▶ cause and effect relationships between human and natural systems are shown;
 - ▶ inquiry questions focus on do-able solutions and relate to opportunities for change in their town/city;
 - ▶ map design and symbols illustrate the proposed changes;
 - ▶ clear explanations are included of why/how selected changes will reduce greenhouse gas emissions.
9. Clarify any questions students might have about the rubric. Ask students how this introduction to maps and the rubric might help them complete the annotated map they are to produce as the final assignment.
10. Ask the students to consider what they will need to know and do in order to complete the final task. Ask them to share their ideas in pairs and then individually have them record their own list of questions. *This list can be used throughout the unit as a planning tool for carrying out the assignment.*

Appendices

1.1 *Effective Map-making*

1.2 *Student Task: Town Planning to Address Climate Change*

1.3 *Town Planning to Address Climate Change: Tips for Getting Started*

1.4 *Evaluation Rubric*

Appendix 1.1 *Effective Map-Making*

All maps tell stories. Thematic maps, such as the ones you will be developing, are made for a special purpose for a special audience. They are powerful geographic tools because they can make patterns visible. In this assignment, you will be mapping a town or city and showing ways in which particular changes to that community can help to reduce or counter greenhouse gas emissions which cause climate change.

Maps can vary greatly even within a given defined task. That is because a map shows the bias of the map-maker. As map-makers (known as cartographers) design their maps, they make choices about what to include, how to represent that choice and what not to include. The design of the map, including artistic features and clear labelling, affects the success of the map, that is, its ability to communicate its message.

Remember to make the decision about which messages you want to convey in your map and then select effective symbols and language before you begin your final copy.

Appendix 1.2 *Student Task: Town Planning to Address Climate Change*

As a member of the local school environment club you have become concerned about the impact of climate change on your local community. The Government of Canada has asked community groups to submit ideas about how towns and cities can respond to the Kyoto Protocol. This requires reducing emissions of greenhouse gases and improving energy efficiency. Your final product will be an annotated map indicating changes to your community that would reduce the emission of greenhouse gases and thus slow climate change.

As you redesign aspects of your local community to reduce greenhouse gas emissions, you will also be reducing its overall Ecological Footprint. For example, parts of the urban system such as transportation, disposal of waste, paved versus green spaces, sources and use of energy might be examined. You might also want to include specific initiatives that businesses and individuals could take. By researching the location's website you will be able to access current strategies and plans they may have for the future. Use the "Climate Change in Canada" map you will be making as a class to find out what impacts climate change will likely have on the community in your region as well as for getting ideas from projects that are currently being implemented across the country.

Appendix 1.3 *Town Planning to Address Climate Change: Tips for Getting Started*

1. As you begin your research of the community that you have selected or been assigned for this mapping project, think about what components make up the *system* of a town or city.
2. As you proceed through this unit, you will learn about the causes of climate change, what kinds of human activity and enterprises contribute to it, and what its impacts are.
3. Your task is to discover possible alternatives to the way we currently organize and operate our communities that could help to slow climate change.
4. As you examine your town or city *as a system*, look for ways to make changes that would reduce or offset climate-changing gases. Here are some components or parts to consider:
 - ▶ Garbage/recycling facilities
 - ▶ Water and sewage treatment
 - ▶ Green space
 - ▶ Recreation
 - ▶ Streets and transportation systems
 - ▶ Housing
 - ▶ Businesses
 - ▶ Tourism
 - ▶ Industry
 - ▶ Alternative energy or energy sources
5. When you have chosen the components or parts of the town/city that you would recommend be changed, you will need to identify your reasons – this should include both (1) how it initially contributes to climate change, and (2) how it can be altered.
6. You will also identify the nature of the recommended changes (some examples — if it reduces emissions, increases carbon dioxide uptake, or possibly even reduces heat output) and the effect that the change will have.

For a list of communities, please see Appendix 5.1a *Towns and Cities: Internet Addresses*

There is a need to prepare for the changes that are anticipated to occur over the next several decades. Part of this preparation involves improving our understanding of the potential impacts of climate change at the regional level.... We must carefully assess the possible consequences of climate change, identify the areas where we are most vulnerable, and take steps to adapt to the anticipated changes.

– Climate Change Impacts and Adaptation Program, Government of Canada, 2004

Appendix 1.4 *Evaluation Rubric*

Category	Criteria	Level 1 (50-59%)	Level 2 (60-69%)	Level 3 (70-79%)	Level 4 (80-100%)
Knowledge/ Understanding Analyse local and regional factors that affect Canada's natural and human systems	Cause and effect relationships between systems shown	Demonstrates limited understanding of relationships between concepts	Demonstrates some understanding of relationships between concepts	Demonstrates considerable understanding of relationships between concepts	Demonstrates thorough and insightful understanding of relationships between concepts
Thinking/Inquiry Develop and use appropriate questions to define a topic, problem or issue to focus on geographic inquiry	Inquiry focuses on real solutions that relate to the opportunities in their town/city	Applies few of the skills involved in an inquiry process	Applies some of the skills involved in an inquiry process	Applies most of the skills involved in an inquiry process	Applies all or almost all of the skills involved in an inquiry process
Communication Communicate the results of geographic inquiries, using appropriate terms and concepts and a variety of forms and techniques	Annotated map design shows selected changes to infrastructure and programming	Communicates information and ideas with limited clarity	Communicates information and ideas with some clarity	Communicates information and ideas with considerable clarity	Communicates information and ideas with a high degree of clarity
Application Predict how current or anticipated changes in the geography of Canada will affect the country's future economic, social, and environmental well-being	Explains why selected changes will reduce greenhouse gas emissions	Makes predictions and plans courses of action with a limited effectiveness	Makes predictions and plans courses of action with some effectiveness	Makes predictions and plans courses of action with considerable effectiveness	Makes predictions and plans courses of action with a high degree of effectiveness