

Climate Inquiry and Dialogue

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A Note to Students: The Challenge and Your Inquiry

The Government of Ontario wants to know your ideas for addressing climate change and moving to a low-carbon Ontario.

Currently, our way of life depends primarily on fossil fuels:

- tractors that produce our food,
- cars and buses for transportation,
- furnaces that heat our homes,
- factories that make all of our goods,
- trucks that transport these goods,
- electricity for so many things (when the electric-generating stations are fueled with fossil fuels).

Burning fossil fuels releases greenhouse gas emissions and these emissions are changing our climate. We need to reduce our use of fossil fuels (conservation and renewable sources of energy) and address the impacts of climate change (for example, the effects of extreme weather events like flooding). This is referred to as a low-carbon Ontario.

You are part of a very unique project: You will be working with over 500 students from across Ontario to come up with ideas on [how to move towards a low-carbon Ontario](#), presenting your ideas to the Government of Ontario in a virtual town hall in May.

Your voices will make a real contribution to creating change, to shaping your future. Here's how:

- Your class will investigate the impacts of climate change in your community.
- Then you will meet in a Virtual Town Hall with other school classes to identify common climate change impacts and actions for addressing these.
- Student writers, selected from your schools, will write up all your work into the document that will be sent to the Premier in advance of the town hall, *Moving towards a Low-Carbon Ontario—A Youth Agenda for Change*.

The 25 school classes are from the communities of Thunder Bay, Sudbury, London, Toronto and eastern Ontario.

Resources and experts to help you conduct your inquiry and participate in the Dialogue: in a separate document you will find resource materials on climate change — in Canada, in Ontario, in your region and by topic; community organizations and experts are ready to speak to your class and answer your questions by email.

Student Instructions

STEP #1 of STUDENT INSTRUCTIONS: WRITE YOUR INQUIRY QUESTION — OR HYPOTHESIS — AND PLAN YOUR INQUIRY:

Working as a class or in small groups, decide on the focus of your inquiry (maybe it's energy use in your community, maybe transportation...) and write your inquiry question or questions. Your inquiry question needs to investigate both the impacts of climate change and the actions required to address it. You could state your question as a hypothesis; for example, "If climate change continues as it is, then extreme weather events like floods will affect the economy of our community." While you are conducting your inquiry, you may need to modify your question or hypothesis.

Plan How You Will Conduct Your Inquiry: In your groups (or individually), plan each step of your inquiry (scroll down further to see more on each of these Steps):

2. Explore & Research
3. Analyze & Check
4. Communicate & Act

STEP #2 of STUDENT INSTRUCTIONS: EXPLORE & RESEARCH

In your groups, gather and review information needed to answer your question or test your hypotheses.

Here's a quick guide to the resources you'll find in the ***Eastern Ontario Inquiry: Resources and Experts Google-Doc*** to help you conduct your inquiry:

How is climate change affecting your community:

- reports and data provided by organizations and agencies in your community, such as your municipality, a conservation authority, and others;
- local experts — again from your municipality, local conservation authority, etc. — who are ready to answer your questions and talk with your class.

More generally, how is climate change affecting Ontario — you can apply this information to your community:

- reports and data provided by scientists, Government staff, etc.
- scientists and policy experts from institutions and the Government of Ontario who are ready to answer your questions and talk with your class.

What mitigation and adaption measures are needed to address the impacts of climate change in your community:

- all of the reports and experts — above — will have information on addressing climate change that is specific to your community, or, that you can apply to your community;
- links to communities around the world that are implementing innovative ways to address climate change.

Evaluate the information you collected: does it answer your question or test your hypothesis?; does it raise more questions (and how can you answer these?)?.

Record your information.

Reflect on and discuss your preliminary findings and observations to compare these to your previous knowledge. You may need to clarify and modify your focus question(s) and inquiry plan.

STEP #3 of STUDENT INSTRUCTIONS: ANALYZE & CHECK

Compare, sort and classify your information. Describe characteristics and note patterns.

Draw conclusions about questions and hypotheses. Remember to focus on both the impacts of climate change and the actions required to address each impact.

The next important step: you will soon meet with the other classes in your community to share and discuss your ideas. You will use your cell phones and Google docs to write up your work. The student writers will use the Google docs to prepare the document you will all present to Premier Wynne.

STEP #4 of STUDENT INSTRUCTIONS: COMMUNICATE AND ACT

Now it's time to act.

Go to the *Commit2Act* App and select actions you can take to reduce your carbon footprint - and track these (calculate the reduction in kilograms of greenhouse gases).

What if you, your family, your classmates took similar actions — small steps become quickly add up.

Armed with your actions, tell your family and school. Tell your school board and your municipality. Use blogs, tweets, charts, videos, PSAs, memes, artwork, presentations to meetings and written reports.

Spiral Inquiry Model



The GreenLearning Spiral Inquiry has been developed to support classrooms across Canada with their research and investigations. Provincial curricula across Canada are implementing new inquiry models that encourage open-ended and student-centered investigations. The GreenLearning version consolidates these into a robust model that is clear and helpful to teachers and students. The teacher facilitated spark and the four delineated stages guide fruitful classroom inquiry. The spiral nature of the model helps students understand that inquiry is not really linear or circular – it is a process with many loops and possibilities and the conclusion of one inquiry can lead to more inquiries in the future.

Spark

Getting “sparked.” What are you curious about with regards to this topic? — what have you noticed: natural ice rinks don’t last very long, flooding in your community, other things — is this climate change? What do you want to know about climate change? Is climate change affecting you and/or will it?, and how can you find out?. Is climate change affecting your community and/or will it?, and how can you find out?.

Hypothesize and Plan

In this stage, you take your spark-discussions to brainstorm and create a working hypothesis which is testable and for which reliable information can be found. You make a plan for research and note-taking. Teacher feedback in this stage helps you focus on workable inquiries.

Explore and Research

You research and gather data gathering including possibilities such as interviews, field work, surveys and contacting experts – it is important to be open to connect with a wide range of sources and ideas..

Analyze and Check

Analyze your data and begin to draw conclusions. Your teacher will help you check against your hypothesis and be open to modifications that could necessitate additional research.

Communicate and Act

Plan how you can act on your findings and communicate your findings to your family, the school or your community. Possible ways of doing this are blogs, tweets, charts, videos, PSAs, memes, artwork, presentations to meetings and written reports.

Teachers

Time Required

Minimum: 5 periods to conduct the inquiry; 1 period to prepare for the Town Hall; a day for the Town Hall; 1 period for follow-up work to the Town Hall;

Curriculum Links Grade 9 Geography, Grade 10 Science, Grade 11 Resource Management, Grade 12 World Issues and others

Geography (CGC1D)

-Strand A: Throughout the course, students will apply the geographic inquiry process, the concepts of geographical thinking, and related skills and spatial technologies in a variety of contexts, from local to global. In so doing, they will develop their ability to think critically, solve problems, and work collaboratively with their fellow citizens to make their community and Canada a more sustainable place in which to live.

Overall Expectations:

A1. Geographic Inquiry: use the geographic inquiry process and the concepts of geographic thinking when investigating issues relating to Canadian geography

B2. Interrelationships between Physical Systems, Processes, and Events: analyse characteristics of various physical processes, phenomena, and events affecting Canada and their interrelationship with global physical systems

C1. The Sustainability of Resources: analyse impacts of resource policy, resource management, and consumer choices on resource sustainability in Canada

E1. The Sustainability of Human Systems: analyse issues relating to the sustainability of human systems in Canada

Teaching Process

Our approach to outlining a Teaching Process is to be comprehensive — providing detailed instructions that you can draw on as you need in facilitating student inquiries and their work in this project.

At some point, explain the project to the students and how it culminates in their presenting their report to the Premier:

The 4 to 5 classes in each community — 4 to 6 — conduct an inquiry into climate change in their community: the impacts and the mitigation and adaptation measures required to address these impacts. There are 5 communities with a total of 27 classes.

- To conduct your inquiries, you will be able to talk with experts such as government climate scientists, the person who works for your municipality responsible for climate change, and, accessing “local reports and data on the COOL database.
- Student leaders — 8 from each class — will be trained in helping to facilitate the Community Town Hall.
- In the Town Hall, you’ll work with the other school classes in this community and with the experts to share your findings and start to write these up — your rough notes.
- Student writers, 2 from each community will meet to use all of the rough notes from all of the schools to draft the “Moving Towards a Low-Carbon Ontario — A Youth Agenda for Change.”
- You with all the other classes will meet in a Virtual Town Hall, with the Government of Ontario to present your report and dialogue on climate solutions.

1. SPARKING THE INQUIRY and PLANNING THE INQUIRY

The “spark” is the key to igniting student curiosity and drawing student into thinking critically about a topic or an issue. The “spark” peaks the student’s interest in a particular topic or question and becomes the starting point for student investigation into something that engages them. As the key facilitator of the inquiry, the teacher will provide an enticing spark to help ignite student curiosity. This could be anything from a scenario or case study to a video, editorial cartoon or a story from the media that helps them see the many possible avenues of investigation within the topic.

One spark is found in the *Student Instructions* above: the Challenge and the opportunity for students to speak with the Premier, presenting their ideas for moving to a low-carbon Ontario to her.

The following spark helps students connect this topic to their lives: Imagine Christmas, Eid, Thanksgiving or Passover, etc. with no electrical power in your apartment, condo or house.

- What would a holiday celebration be like without electricity?
- What would be different?
- How would you feel?
- What alternative arrangements could be made?
- How would it be worse in winter?
- Are people who live in cities more vulnerable than those who live in rural areas?

What have you Noticed, Observed, Wondered about: Discuss as a class the changes in weather/climate that you have noticed (nights in the summer seem to be hotter, the skiing season is shorter, the weather seems more extreme, water levels at a friend's cottage are lower...).

Other Sparks:

- A guest speaker expert connected with the issue of climate change at the local level — just to get ideas rolling. Intended only to start a further discussion from which students can identify their own questions and direction.
- A pancake breakfast where half the class gets maple syrup and the other half, a corn syrup — *which do you prefer?*, and *will climate change affect the availability (cost) of maple syrup?*
- Pick a selection of small high-interest news stories (e.g., the mass die-off of penguins this week) — show one at the show start of 5 consecutive classes without reference to climate change — discuss. On day 6, .ask *what was the connection?*
- Tourism and hunting/fishing in Bancroft and other rural communities is among the primary sources of income to the local economy. In terms of a hook for students a presenter or guest speaker in the tourism industry or local MNR would be more interesting than a website or video. A video or website would be great as a supporting element.

After the initial spark and discussion, students brainstorm how climate change is and might affect communities in general and your community (municipality) in particular; consider:

- human health,
- the ability of your community to manage in extreme weather event like flooding
- water
- transportation
- economic activity in your community: manufacturing, agriculture, forestry, etc.
- recreation

Supporting students in this phase of inquiry:

- value student thinking — listen, observe and talk with students to assess interests, knowledge and needs;
- model wondering, questioning and make predictions, especially around this topic (including how you as a teacher might grapple with your daily life and your own GHG emissions, “I would like to take public transit to school but it’s too inconvenient — what if the school board had a policy of placing teachers in schools near where they live?”);
- facilitate student discussion and brainstorming, helping them develop clear inquiry question(s) (hypothesis).

STEP #2: EXPLORE & RESEARCH

A rich variety of "local" and other resources are provided that will enable your students to conduct their Inquiries (in a separate document). This document is designed for students and will be much more helpful than the "Google gives me everything I need." habit.

Supporting students in this phase of inquiry:

- assist students in finding information and in assessing that information;
- extend student thinking with open ended questions;
- help students to use this information to challenge their prior knowledge and beliefs;
- encourage students to share their ideas and knowledge.

Step #3: ANALYZE & CHECK

Supporting students in this phase of inquiry:

- facilitate discussions in which students make connections between prior knowledge and new discoveries, describe characteristics and note patterns, and, draw conclusions;
- challenge and extend students' understandings and skills.

The key support from the teacher in this section is facilitation, helping the students dig deeper in their analysis, helping them see where the data takes them and helping them to prepare to report on and communicate their findings. Ensure that they are open to the possibility or rethinking their inquiry or their inquiry question as a result of what they find.

Step #4: COMMUNICATE & ACT

Communication and Action are key components in the authentic Spiral Inquiry Method.

Students can use the *Commit2Act* App to select and track actions to reduce their personal carbon footprint. Some of the actions listed indicate the resulting reduction in greenhouse gas emissions; students can use these data to estimate the reductions if all of their family took certain actions, all of their class, and all of the school — and experience how small actions add up.

Students can brainstorm and analyze their own action ideas.

This inquiry provides a rich communication opportunity for students to design and deliver presentations on their work to the school administration, school board trustees and the local municipality (experience show these bodies are often hungry for meaningful student engagement and there are many examples of students affecting real change through these fora).

Students can use blogs, tweets, charts, videos, PSAs, memes, artwork, presentations to meetings and written reports.