

Climate Change in My Watershed Inquiry

Spiral Inquiry Activity
Grade Level 9 – 12
Climate Change Where I Live



Climate Change in My Watershed was developed by Aleks Erdelyi and Rob Millard of Notre Dame Catholic High School (Carleton Place) with Dick Holland and Gordon Harrison of GreenLearning Canada.

About This Activity

Learners will use GreenLearning’s Spark Inquiry Model to examine the impacts of climate change in their watershed, identify the mitigation and adaptation measures required to address these changes, and take action.

Learning Outcomes

By the end of this activity, learners will:

- Discover the implications of climate change on their watershed
- Investigate various topics surrounding the impacts of climate change, and present their findings to the class
- Collaborate amongst peers to develop their own focus question(s) and inquiry plan

Length of Activity

1 – 1.5 hours

Materials List

Internet-enabled device
 Climate Change in My Watershed Inquiry Worksheet

The Spiral Inquiry Model

- a. Begin by getting familiar with GreenLearning’s Spiral Inquiry Model found here:

<https://programs.greenlearning.ca/course/spiral-inquiry-model>

Background Information

- a. Begin by watching this YouTube video titled: [USDA Watershed Learning Animation](#) from the U.S. Department of Agriculture (3:10 min)
- b. Then, examine this [Conservation Ontario Poster](#) and answer the following questions:
 - Define watershed in your own words. Alternately, draw and label a diagram of a water shed.
 - What are three key ways that watersheds affect you?
 - Why can a watershed be described as a system?
 - The great thinker Edward de Bono once proposed that industries located on rivers have their waste pipes located upstream from their inflow pipes. Why?
- c. After discussing the answers as a class, investigate the [Conservation Ontario Website](#) to identify the watershed in which your school is located. Explore the website and generate one question you would like the class as a whole to discuss.

Step 1: Spark (A Student Investigation)

- a. Pose the question: “What would be worse for your community: spring floods or summer drought?”
- b. Allow learners to break out into think-pair-share groups to begin generating some ideas.

- c. Ask the groups to share their ideas, and record down their responses in a bullet list at the front of the class on the board.
- d. Discuss as a class the changes in weather/climate they have noticed (no longer need to wear coat under your Halloween costume, skiing season is shorter, water levels at a friend's cottage are lower... etc.)
- e. Focus your discussion on what you have actually seen/observed/already know with respect to your watershed: changes in the climate and how they affect the watershed (e.g. extreme weather events, lower water levels, etc.), the consequences of these (on fish, human health, agriculture, forests, recreation, etc.) and who would be affected (farmers, tourists, loggers, etc. – and you!).

Step 2: Hypothesize and Plan

- a. As a class, decide the focus of your inquiry.
- b. Learners can be split up into groups so that they can brainstorm potential inquiry questions. Have the groups discuss what they have taken away from the class discussions.
- c. You will want the learners to choose how they structure their inquiry and this will emerge as you listen and help guide their discussions from the side.
- d. Remind learners that the inquiry question needs to investigate both the impacts of climate change on their municipality and the actions required to address it.
- e. Allow learners to state their questions as a hypothesis using the "If...then...because..." format. For example, "If climate change continues as it is, then frequent droughts will make our community poor." On your own, or in groups, think of your own wording! Create flexible groups based on your interest. These groups might be topical
 - a. Water
 - b. Fisheries
 - c. Recreation and tourism
 - d. Forests
 - e. Health
 - f. Ecosystems
 - g. Agriculture etc.

- Farmers
 - Tourist operators
 - Local politicians etc.
- f. Hand out the Climate Change in My Watershed Inquiry Worksheet to the learners in their groups and allow them to complete Part 1.

Step 3: Explore and Research

- a. This step involves the groups of learners to research the information required for their topic.
- b. Inform learners in their groups to gather and review information needed to answer their questions or to test their hypotheses. The internet, libraries, or experts in the field are all great tools for research.
- c. Hand out the Climate Change in My Watershed Inquiry Worksheet to the learners and allow them to complete Part 2. Be sure to remind learners to record their information and remember to keep track of their sources. Groups can evaluate their information they have collected and answer these questions:
 - i. Does your research answer your questions or test your hypothesis?
 - ii. Does it raise more questions, and how can you answer these?
- b. Allow groups to reflect and discuss their findings and observations to their previous knowledge. They may need to clarify and modify their focus question(s) and inquiry plan.

Step 4: Analyze and Check

- a. Allow learners to compare, sort and classify their information.
 - i. Learners reflect on and discuss their preliminary findings and observations to compare this to their previous knowledge and they clarify and modify their focus question(s) and inquiry plan.
 - ii. Learner's review and evaluate the information they collected and record this information.

- iii. Learners use their information to answer their inquiry question(s), test their hypotheses, describe patterns and draw conclusions.
- iv. Learners reflect on their findings to create new questions and hypotheses.
- b. Get learners to draw conclusions about your questions and hypotheses.
- c. Hand out the Climate Change in My Watershed Inquiry Worksheet to the learners in their groups and allow them to complete Part 3.

Step 5: Communicate and Act

- a. Now the groups are ready to turn their knowledge into action! Allow the learners to communicate their findings to the class. Be sure to remind them about the message they want to get across and to tailor it to the classroom audience.
- b. During their research, learners may have come across many calls to action. You could present your Inquiry to the local conservation authority, and/or share your final project at farmers markets, local radio stations, mall displays, local fairs, science fairs, etc.
- c. Learners can also create a public service announcement (PSA), a mind-map, an infographic, or a poem / song and present this to an appropriate audience.

Step 6: Conclusion

- a. Refer to the marking rubrics on the various ways learners could communicate their findings.