

Make a Splash!

Spiral Inquiry Activity
Grade Level: 6-12



About This Activity

Climate change is not a future possibility – it is a present reality. What impact is this having on Canadian lakes, rivers, creeks, ponds and streams? How will recreation change? What are the economic consequences? In this activity, learners will use GreenLearning’s spiral inquiry method to research a personal and/or a local focus for these broader challenges.

Learning Outcomes

By the end of this activity, learners will:

- Discover the implications of climate change on freshwater resources
- Investigate various topics surrounding the impact of climate change on Canadian bodies of water, and present their findings to the class
- Collaborate amongst peers to develop their own focus question(s) and inquiry plan

Curriculum Connections

Dependent on educator

Length of Activity

Dependent on educator

Materials List

Internet-enabled device
 Make a Splash! Inquiry Worksheet
 Educator Resource
 Marking Rubric

Before you begin

- a. Begin by getting familiar with GreenLearning’s Spiral Inquiry Model found here: <https://programs.greenlearning.ca/course/spiral-inquiry-model>

Step 1: Spark (A Student Investigation)

- a. Pose the question, “How does climate change impact our freshwater resources?” to the class at large.
- b. Partner learners up. Ask each pair to create a mind map of why freshwater recreation is so important to humans. Learners can think of different possible impacts such as health, economics, recreation, etc. They could also think of immediate consequences and also things that might then arise as a result of those consequences. Note the many possibilities:
 - i. Summer recreation
 - ii. Winter activities
 - iii. Employment
 - iv. Human health
 - v. Drinking water
- c. Have learners share their mind maps and add points as they see what others have generated.
- d. Post the charts around the room. Circulate and draw a circle around any point that could be affected by climate change.
- e. Use Google Maps to explore the bodies of water in your community. Make personal

connections with sources of freshwater and recreation. Note the many possibilities as listed in point b.

Step 2: Hypothesize and Plan

- a. As a class, decide the focus of your inquiry. Use the Spark discussion and activities to help you decide. Revisit the mind map and think of the issues, topics, and climate change concerns that the class shared. Learners' own interests and issues in their community can help them pursue something that is connected to their lives.
- 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. Pose the following questions:
 - i. What climate change concerns does your group have?
 - ii. What issues interest your group and are relevant to their lives?
 - iii. What topics do you want to research?
- c. 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 outdoor hockey and skating season will be shorter and shorter."
- d. Remember! While learners are conducting their inquiry, they may need to modify their question or hypothesis. Remember to make it something that is testable and workable with what they have.
- e. Hand out the "Make a Splash! 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. Below are some investigation suggestions (Note that each one gives you an overview, provides some ideas on research directions and gives you a few online resources to start with:
 - i. Algal blooms

- ii. Beaches
 - iii. Birds and Bird Watching
 - iv. Boating
 - v. Camping
 - vi. Citizen Science
 - vii. Cottage Life
 - viii. Fishing
 - ix. Flooding
 - x. Frogs
 - xi. Gardens
 - xii. Hunting
 - xiii. Invasive Species
 - xiv. Ponds and Wetlands
 - xv. Skating and Ice Sports
 - xvi. Snowmobiling
 - xvii. Stream Studies
 - xviii. Summer Camp
 - xix. Swimming
 - xx. Tourism Industry
 - xxi. Water Quality
- 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 "Make a Splash! Inquiry Worksheet" to the learners in their groups 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.
 - b. Get learners to draw conclusions about your questions and hypotheses. Remind them to focus on both the impacts of climate change on freshwater recreation and the actions required to address each impact.
 - c. Get learners to draw conclusions about your questions and hypotheses. Remind them to focus on both the impacts of climate change on maple syrup and the actions required to address each impact.
 - d. Hand out the “Make a Splash! Inquiry Worksheet” to the learners in their groups and allow them to complete Part 3.
- iv. Speaking at public meetings
 - v. Awareness Fair
 - vi. Developing and passing around petitions
 - vii. Take part in organized learner action competitions
 - viii. Greening your schoolyard
 - ix. Freshwater monitoring
 - x. Youth Summit
 - xi. Raising Northern Leopard Frog tadpoles
 - xii. Tree planting
 - xiii. Stream cleanups
 - xiv. Choosing “low-impact” recreation like hiking and canoeing

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. Learners might produce a YouTube video, PowerPoint presentation, research blog, web pages on the school site, podcast, meme, skit or play, mind map, poster, or infographic, etc.
- b. Your audience does not have to be just your class. Think of other people who can benefit from learning what you discovered: younger students, school council, parents, display in a local mall, part of a school assembly for Earth Day or other occasions, experts who helped your research.
- c. As you have been researching your inquiries you have probably come across many calls to action; ideas for what you and your class could do to make things better for freshwater and everything that depends on it. There are many suggestions classes have for helping with freshwater and recreation issues:
 - i. Take part in a local bird or frog count
 - ii. Campaign to change shopping habits
 - iii. Meeting with local politicians about issues

Step 6: Conclusion

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