

Climate Change in the Arctic Study

Overview

In this study students will look at how the change in climate is directly affecting the people and culture of the arctic. Students will examine information from Inuit organizations in Nunavut and make connections between western science and the connections that exist between the people and the land. This study can also lead to examinations of how climate change is affecting other Indigenous communities such as the late formation of ice roads, access to hunting, changes in the land and ecology and how these pressures force changes in ways of living. Students should also be looking at how changes in climate are affecting their own communities through things like greater frequency of extreme storms, extreme temperatures or dry conditions.

Expectations list by grade

Grade 10, Academic (SNC2D)

- D1. analyse some of the effects of climate change around the world, and assess the effectiveness of initiatives that attempt to address the issue of climate change
- D1.1 analyse current and/or potential effects, both positive and negative, of climate change on human activity and natural systems [AI, C]
- D2. investigate various natural and human factors that influence Earth's climate and climate change
- D2.1 use appropriate terminology related to climate change, including, but not limited to: albedo, anthropogenic, atmosphere, cycles, heat sinks, and hydrosphere [C]
- D2.3 analyse different sources of scientific data (e.g., lake cores, tree rings, fossils and preserved organisms, ice cores) for evidence of natural climate change and climate change influenced by human activity [PR, AI, C]
- D2.8 classify the climate of their local region using various tools or systems, and compare their region to other regions in Ontario, Canada, and the world [AI, C]
- D2.9 compare different perspectives and/or biases evident in discussions of climate change in scientific and non-scientific media (e.g., with reference to knowledge, beliefs, and values) [AI, C]

Earth and Space Science, Grade 12, University Preparation (SES4U)

- D1. analyse, with reference to geological records, the relationship between climate, geology, and life on Earth, and evaluate contributions to our understanding of changes in Earth systems over geological time
- D1.1 analyse the relationship between climate and geology, and, using geological records, assess the impact of long-term climate change on life on Earth [AI, C]
- D1.2 evaluate the significance of contributions, including Canadian contributions, to our understanding of geological time and of changes in Earth systems over time [AI, C]

Environmental Science, Grade 11, University/College Preparation (SVN3M)

- B1.1 analyse, on the basis of research, social and economic issues related to a particular environmental challenge and to efforts to address it [IP, PR, AI, C]
- B1.2 analyse ways in which societal needs or demands have influenced scientific endeavours related to the environment [AI, C]
- B2. investigate a range of perspectives that have contributed to scientific knowledge about the environment, and how scientific knowledge and procedures are applied to address contemporary environmental problems
- B2.4 use a research process to investigate how evidence, theories, and paradigms reflecting a range of perspectives have contributed to our scientific knowledge about the environment and communicate their findings [IP, PR, AI, C]
- B2.5 use a research process to locate a media report on a contemporary environmental issue, summarize its arguments, and assess their validity from a scientific perspective [IP, PR, AI, C]
- C1. analyse initiatives, both governmental and non-governmental, that are intended to reduce the impact of environmental factors on human health
- C1.1 analyse grassroots initiatives that are intended to reduce the impact of environmental factors on human health [AI, C]

Assessment for Learning

Assessment in this study will be two-fold. Teachers should be guiding students through an inquiry process grounded on scientific method that builds an understanding of the complex principals behind climate change, and the effects these changes have on how people live. This can lead to rich discussions about how we impact our world and how the world impacts us, which highlights the Indigenous understanding of how we are part of the world and the environment not merely an impartial observer. Students should push their thinking and question their own conclusions throughout this study.

Inquiry Method:

This study should lead to an examination of data looking at the concrete effects climate change has on a population. It should be an authentic examination of the effects that climate has on societal needs like access to food, fuel and the necessities of life. It will also be a good example of how to use of anecdotal data from the communities involved to learn how this change is affecting people and the environment in very real ways. If time is given, students can look at how climate change in their own community is leading to changes in land use and adaptations.

Learning Goals:

The overall goal of this study is to examine how climate change is affecting communities and people and potentially forcing changes. Students will also be able to:

- reflect on how human activities impact our environment
- gather evidence on how human activities impact our environment
- explain how human activities impact our environment
- analyse the relationship between climate, geography and geology

Minds on:

First have students read [Inuit Perspectives on Recent Climate Change](#). Ask students what sorts of things they notice about the reliance on stories from elders for recording change and also the respect for the observations of people who are actually experiencing the change. Then have students read one of the following articles: [A Disappearing Home in a Warming World](#) or [Arctic Meltdown: How Climate Change Is Disrupting The Inuit Of Clyde River](#). Ask the students, what do they hear from the people who live in the arctic? Help them record the changes that are occurring and the impacts they are having on people, and the environment. Students could create a hand-written t-chart for this or use available technology in the classroom. **(1 class)**

Activities

1. Have students read through some of the reports found on [Unikkaaqatigiit: Canadian Inuit Perspectives On Climate Change](#). In particular they can scan the document [Unikkaaqatigiit: Putting The Human Face On Climate Change](#). Record with them the observable phenomena that people living in the north are experiencing. At this point work with students to make connections to environmental science. Why is the weather, landscape, vegetation and other life changing? **(30 min)** Then have students look at their own environment. Have they noticed changes in their own areas? This is a good time to involve the experiences of students from other parts of the world, or those who have family in other places. Ask them if they have similar observations about environmental changes and its effect on how people live. **(30 min)** This is a good opportunity to have students ask older family members at home about changes they have seen during their lifetime. Help students make connections between the technical aspects of climate change and the observable changes Inuit people are describing.
2. Work with students to investigate the various natural and human factors that are currently influencing the Earth's climate and try to pinpoint those aspects that are being observed in the arctic. Look for other sources of data available from researchers about climate change which could include historical temperature data, lake cores, tree rings, or ice cores for evidence of natural climate change and changes influenced by people. **(45 min)** Again bring students back to a discussion about how people are connected to the environment and that we impact it at the same time it impacts us. **(15 min)**

3. Next, in order to analyse social and economic issues related to changes in the environment, look at the website [Climate Change and our Lands in Film: A Yellowknives Dene First Nation Youth Climate Change Adaptation Plan](#). (This reading can be assigned as homework in order to set up the next day's work) Ask students what perspectives they notice the Dene youth bring to the problem of environmental change and the role that traditional knowledge plays. Then have students consider how this traditional knowledge might play out within their own local communities. **(15 min)** This is an opportunity to reach out to local Indigenous communities to invite a knowledgeable and recognized community member to visit the classroom to share their experience and understanding about the local environment. **(1 class when a community member is available)** When done with respect and openness, this practice demonstrates to students how to approach people with knowledge specific to the land they live on, and make connections between western science and traditional knowledge.
4. In a continuation of earlier analysis, share parts of the [climate change report from the Assembly of First Nations \(AFN\)](#). Focus on the observations within the report of various Indigenous people. Again, what are people saying within diverse communities and what does this demonstrate about the wide range of impacts that climate change is having. **(30 mins)** PLEASE NOTE: the AFN itself is a contentious organization as a representative body for Indigenous people. The use of the report here is to access the voices of some Indigenous people. At no time should it be represented as the sole or unified voice of all Indigenous people in Canada. Preference should always be made for local Indigenous people. This activity is included to supplement information and to expand students understanding of the wide breadth of cultural effects and points of view about climate change.
5. Share parts of the article [Environmental Change – The Elders Speak](#). The article contains the historical observation of Indigenous people and again it demonstrates the strength of oral knowledge when trying to account for the changes that are happening to the environment and to understand them. **(20 mins)**

Consolidation:

This study leads to several possible research projects for students. Students might look at the effect climate change is having on people and communities, specifically Indigenous people who are closely tied to the lands they live in, or they might look at how community members' stories about changes in the environment point to problems with climate change and also how traditional knowledge and ways of living could lead to solutions. As asserted earlier, this is a good study to get involved with local Indigenous communities to learn from them about how the climate is changing and the actions that might be taken to mitigate the effects. Students can demonstrate their learning through presentations, videos, or other communication tools.

Additional resources to support learning:

Students can look at the following resources to learn how different Indigenous peoples are reacting to and tackling climate change.

- [Indigenous Climate Action](#)
- [Impacts and Adaptations for First Nation Communities](#)
- [United Nations Report - Climate change and Indigenous peoples](#)

Could the UNDRIP or specific articles also be added here? To demonstrate connections to climate change and Indigenous Human Rights?