

Learning objectives

- Students will learn about the scientific research that occurred on the 2014 Victoria Strait Expedition.
- Students will examine the steps of scientific thinking and inquiry.

Time required

50-70 minutes

Grades

4-8

Materials

- “Scientist Biography Report” worksheet
- “The Scientific Process” handout
- “Scientists Biographies” handout
- Access to the internet for research

Set-up

Make copies of the “The Scientific Process” handout for all students, make three copies of the “Scientist Biography Report” worksheet.

Links to the Canadian National Standards for Geography

Essential Element 1: The World in Spatial Terms

- Map types

Essential Element 2: Places and Regions

- Political and historical characteristics of regions
- Changes in places and regions over time

Essential Element 5: Environment and Society

- Limits and opportunities of the physical environment for human activities

Essential Element 6: The Uses of Geography

- Influences of physical and human features on historical events
- Effects of physical and human geographic factors in major historic events

Introduction

Explain to the students that expeditions usually have more than one goal. The 1845 British Arctic Expedition led by Sir John Franklin was searching for the Northwest Passage, but also intended to map the Arctic region and research how the British Empire could further explore the area. The primary goal of the 2014 Victoria Strait Expedition was to locate the missing ships from the 1845 British Arctic Expedition but it also had several other goals. A number of scientists and researchers took part in the 2014 expedition and had the opportunity to pursue other research goals. Discuss the following goals of the 2014 expedition:

- Map the Arctic seabed
- Undertake terrestrial archaeology surveys and excavations on King William Island
- Use satellite imagery to collect data about sea ice type and extent, coastal features and shoreline delineation
- Discover how localized environmental stressors as well as regional climate changes impact aquatic ecosystems in the Canadian Arctic
- Explore how side-scanning sonar could be used to determine how ice masses, including sea ice, ice shelves and glaciers have been changing on Northern Ellesmere Island, and how these changes interact with each other
- Undertake a reconnaissance survey of whales in relation to sea ice concentrations, to contribute to a study of climate-induced prey shifts on beluga whales in the Beaufort Sea
- Examine the ice characteristics in the area where the Franklin vessels were abandoned to interpret the historical evidence, mostly Inuit testimony, thereby helping to plan the search effort

Continue the discussion by reviewing the scientific process with your students (hand out copies of “The Scientific Process”) and asking them to determine how each of these goals could be achieved through this process. Although this is known as the scientific process, explain that many other disciplines follow similar processes (refer to the activity “Faces of the Franklin Expeditions” for a more in-depth look at this).

Development

Divide your class into small groups. Distribute the “Scientists Biographies” handout and have each group research a scientist and complete the “Scientist Biography Report” worksheet attached. Explain that inquiry is another way to describe the process of asking questions to investigate a topic. Inquiry is a process, which means that there are steps involved. Have each group brainstorm how their scientist might have approached his/her particular goal using an inquiry process. Be sure that all groups are looking at the information that was collected by each scientist and viewing the videos that were produced to get all information necessary to complete their worksheets.

Conclusion

Have each group of students present their scientist to the rest of the class, using the checklist on the “Scientist Biography Report” worksheet as a guide. When all groups have presented, have a discussion about other topics that might lead to future scientific research in the Arctic.

Extend your geographical thinking

Have your students explore geographical perspective by assessing the importance of the 2014 Victoria Strait Expedition and the discovery of HMS *Erebus* through the lens of a conservationist, business owner, Inuit resident or tourist.

For more information about the search for Franklin's lost ships, please visit www.pc.gc.ca/eng/culture/franklin/index.aspx

Scientist Biography Report:

Name:

School:

Research topic:

What goal is the scientist working towards?

Why was the scientist on the 2014 Victoria Strait Expedition?

What was the result of the scientist being on the expedition?

What research was necessary before the expedition?

What tools were needed to conduct their research?

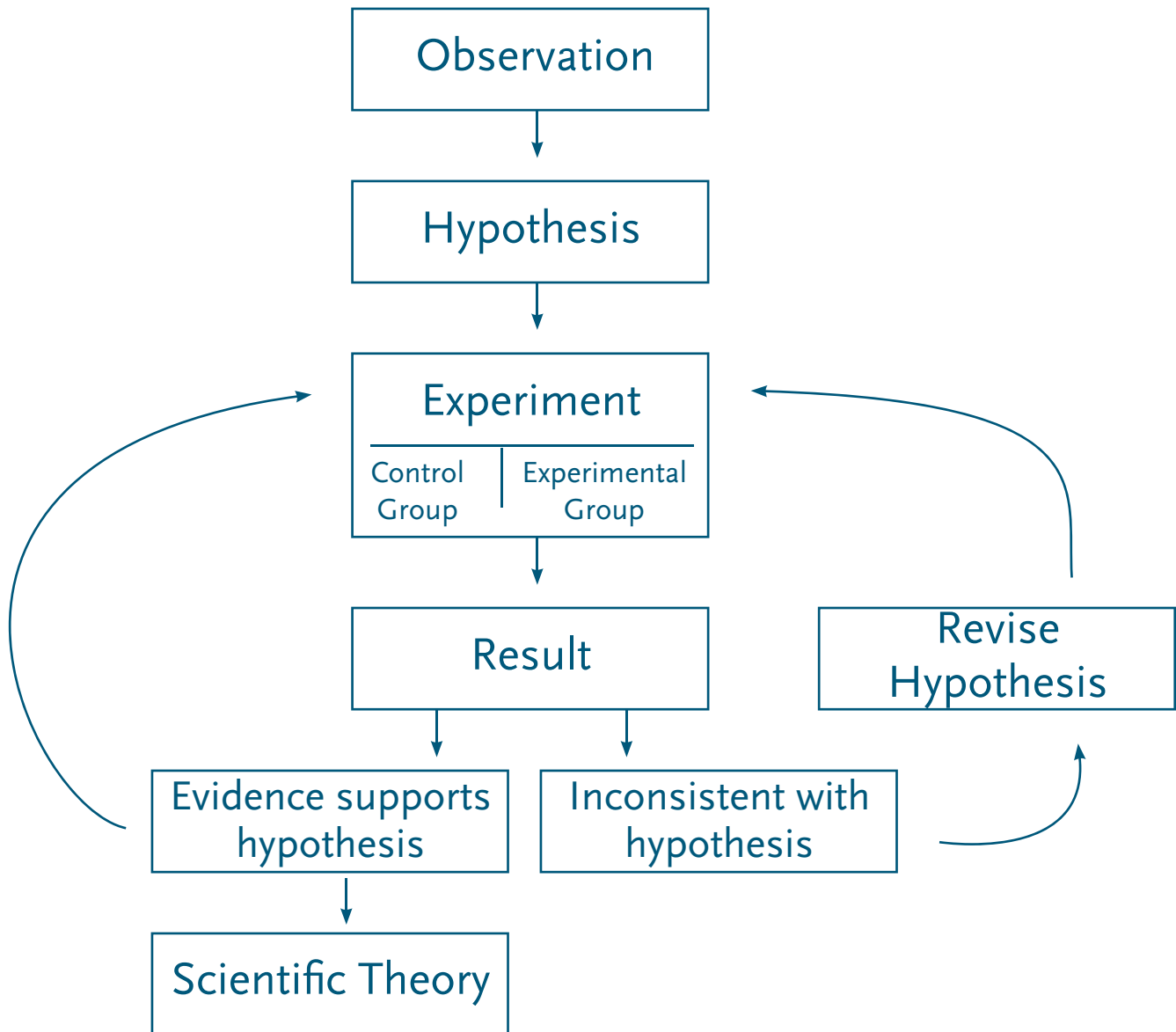
What does the scientist have to do now that he or she is back?

Do you think the scientist will be successful in their research?

Checklist for presentation:

- Name of scientist
- School the scientist attends (if available, academic level they are working at)
- What is their research topic?
- Summarize their experience on the expedition
- How will they contribute to a better understanding of the Arctic?

The Scientific Process



Scientists Biographies

Emily Choy

<https://sites.google.com/site/emilyschoy>

My PhD research examines the consequences of climate-induced shifts in the prey of beluga whales in the Beaufort Sea. Beluga whales are marine mammals that select habitat based on sea-ice concentrations – they rely on sea ice to help hide from their predators and find food around sea ice. One of the major prey species of the Beaufort Sea beluga population is Arctic cod, which also live where there is sea ice. Therefore, the loss of sea ice due to climate change will not only affect beluga habitat-use, but also will affect the abundance and distribution of prey.

On the Victoria Strait Expedition, I attempted to do a reconnaissance survey of cetaceans in relation to sea-ice concentrations. A reconnaissance survey is basically a count of species in an area. Beluga whales, bowhead whales and narwhals can be found in Lancaster Sound, Prince Regent Inlet and Peel Sound. Unfortunately for me, no whales were sighted by myself or any of the naturalists on the expedition. However, I sent the marine mammal survey list of pinnipeds (seals) conducted by the ship naturalists to the marine mammal research scientists at Fisheries and Oceans Canada, since they do not have much knowledge on species abundance in the route covered by our expedition. They confirmed to me that the species that had been sighted were all common species to the area.

Tom Zagon, Canadian Ice Service

<http://www.ec.gc.ca/glaces-ice/>

My work took place before the 2014 expedition in that I wrote an ice study based on archived satellite imagery, using images from Canada's RADARSAT-1 and RADARSAT-2 satellites. That study examined the ice characteristics in the area where the Franklin vessels were abandoned and was used to interpret the historical evidence, mostly Inuit testimony, thereby helping to plan the search effort.

I am a scientist at the Canadian Ice Service (CIS), part of Environment Canada. Prior to joining CIS, I worked in providing ice information to vessels navigating the Canadian Arctic and working on the development of shipboard ice information systems. I've been looking at satellite imagery of sea ice for over 20 years.

Joshua R. Thienpont, PhD

www.thienpont-korosi.com/

My research focuses on understanding how localized environmental stressors (such as permafrost thaw and oil and gas development), and regional climate changes affect aquatic ecosystems in the Canadian Arctic. In particular, I am interested in how changes in sea ice, rising sea levels and more intense and frequent storms are impacting coastal, freshwater lake ecosystems. My research has focused primarily on the Mackenzie Delta in Canada's western Arctic, and how changing environmental conditions have impacted this economically, culturally and ecologically important ecosystem.

Adrienne White

<http://cryospheric.org/people/adrienne-white/>

My PhD research focuses on determining how ice masses, including sea ice, ice shelves and glaciers, have been changing on Northern Ellesmere Island, and how these changes interact with each other. During this expedition, I had the opportunity to investigate the potential use of side-scanning sonar — like the one used on the AUV (autonomous underwater vehicle) to find the Franklin ships — for imaging the basal (bottom layer) topography of the ice masses in my study area. Furthermore I was able to meet with other Arctic scientists to discuss potential collaborations in the near future.