Harp Seal: Population, Distribution and Migration

Lesson Overview:

Students will search and analyze Internet information to educate themselves on the harp seal found in the Arctic and sub-Arctic waters of the North Atlantic Ocean. This lesson will focus on the estimated population, distribution and migration of the harp seal in the Northwest Atlantic harp seal population.

Grade Level:
Grades 9-12 (Secondary)
Grades 7 to 9 (Middle)

Time Required: Two to three classes

Curriculum Connection:

Atlantic Province Education Foundation Curriculum for Social Studies General Curriculum Outcomes
People, Places and Environment. Students will be expected to demonstrate an understanding of the interactions among people, place and environment.
Interdependence. Students will be expected to demonstrate an understanding of the interdependent relationships among individuals, societies, and the environment – locally, nationally and globally – and the implications for a sustainable future.

Prince Edward Island: World Geography and Science
With modifications: Intermediate Science and Intermediate Social Studies

This lesson can be easily adapted to any Atlantic Provinces or Canadian secondary and intermediate curriculum.

Links to Canadian National Standards for Geography:

Essential Element #1: The World in Spatial Terms
- Use maps to reveal and analyze relationships
- Expanding locational technology – tracking device

Essential Element #2: Places and Regions
- Regional analysis of geographic issues and questions
- Critical issues and problems of a region
Essential Element #3: Physical Systems
- World climate regions
- World patterns of biodiversity
- Inter-annual climate variation

Essential Element #5: Environment and Society
- Environmental issues – loss of biodiversity
- World patterns of resources distribution and utilization

Geographic Skill #1: Asking Geographic Questions
- Speculate about possible answers to questions
- Plan how to answer geographic questions
- Identify issues related to ecosystems

Geographic Skill #2: Acquiring Geographic Information
- Use of variety of maps to compile and construct maps
- Use various Internet websites to locate information
- Use of variety of research skills to locate and collect information

Geographic Skill #3: Organizing Geographic Information
- Constructing geographical maps
- Using digital photographs

Geographic Skill #4: Analyzing Geographic Information
- Recognize patterns for distribution of given populations
- Draw inferences about migration patterns
- Seek patterns for relationships between migration and distribution

Geographic Skill #5: Answering Geographic Questions
- Generalization based on information collected and processed
- Using inductive and deductive reasoning
- Communicate clearly and effectively by answering questions

Link to the Canadian Atlas Online
www.canadiangeographic.ca/atlas/
Additional:  www.ipy.org
            www.atlas.nrcan.gc.ca/site/index.html

Additional Resources, Materials, and Equipment Required:
PowerPoint Presentation-attached
Computer and Internet access
Projectors: Digital and overhead
Student worksheet-attached
Assessment rubric-attached
Main Objective:
The primary objective is to examine the estimated population, distribution, and migration patterns of the harp seal. Students will analyse and construct two maps showing the distribution and migration of harp seals.

Learning Outcomes: By the end of the lesson, students will be able to:

- Identify and describe a harp seal.
- Name and locate the three main populations that compile the Arctic and sub-Arctic harp seal population.
- Locate and analyze information on the population, distribution, and migration of the harp seals.
- Construct maps showing the distribution of the total harp seal population and a map showing the migration pattern for harp seals found in the Northwest Atlantic region.
- Answer questions related to the information gathered from various websites.
## Introduction
The harp seal has three distinctive, widely separated populations in the Arctic and sub-Arctic regions:

- **a. White Sea** north of Russia
- **b. West Ice near Jan Mayen Island**
- **c. Northwest Atlantic**

### List or discuss several reasons for using tracking devices on harp seals.
Suggest why the devices are invasive or non-invasive.

## Lesson Development

**Students are challenged to analyze population statistics for Northwest Atlantic population and map the distribution of populations that form the total Arctic and Sub-Arctic harp seals population.**


2. Instruct students to search for the [Department of Fisheries and Oceans](http://www.dfo-mpo.gc.ca) website, along with other sites to locate information on the total population, distribution and migration routes for the harp seal populations located in the Polar and sub-Polar region.

3. Direct students to complete tasks on "Student Worksheet". (attached):
   - Two maps
   - Questions

1. Go to [DFO](http://www.dfo-mpo.gc.ca) site to analyze the graphs located in the article “Northwest Atlantic Harp Seal” and predict the trends for harp seal populations and harvesting rates.

2. Following instructions on “Student Worksheet”, search the Internet to locate various sites on the distribution of harp seals in the Arctic and sub-Arctic regions.

3. Based on search, design two maps to show:
   - Distribution of harp seals in the Polar region.
   - Migration routes of the harp seal for the Northwest Atlantic Harp seal population.

4. Complete by answering questions.
Conclusion
The process and cumulative product will allow students to better understand the role played by distribution and migration of the harp seal population and its influence on the surrounding peoples of the Arctic and sub-Arctic region.

Conclude with a 15-20 minute discussion on the future of harp seal population. Discussion should centre on the use of the harp seal by both commercial and traditional hunters. Given the status of harp seals state arguments whether the Canadian government can or cannot justify an annual harvest of harp seals.

5. Discuss implications of increasing/decreasing levels of harp seal populations and speculate on their positive or negative impacts on other species and on the economies of nearby communities, especially in the context of global warming.

Lesson Extension:
Students can:

- Examine the pros and cons of the annual commercial seal hunt (see further reading below)
- Examine subsistence harvesting of seals to people of Arctic and sub-Arctic regions
- Research the present population and diet of harp seals.
- Research possible impacts of harp seals populations on future cod stocks

Assessment of Student Learning:
Students will be assessed based on the completion of two maps and student worksheet. In addition, group research and map work will be based on rubric (attached).

Further Reading
Students can be challenged to examine the controversial issue of the annual seal harvest off the Gulf of St. Lawrence and northeast coast of Newfoundland. The following are suggested websites:

**Pro:**
http://www.dfo-mpo.gc.ca/seal-phoque/index_e.htm
http://www.yptenc.org.uk/docs/factsheets/animal_facts/harp_seal.html
http://www.osc.mun.ca/seals/harp.html
Con:
http://www.harpseals.org/
http://www.imma.org/harpseal.html
http://www.pinnipeds.org/main.htm
http://www.pinnipeds.org/species/harp.htm
http://www.harpseals.org/hunt/index.html
http://www.greenpeace.org/international/news/harp-seal-hunt

Harp Seal: Population, Distribution and Migration

Student Worksheet

Your primary objective is to examine the estimated population, distribution, and migration patterns of the harp seal. You are asked to critically analyze the information for population estimates from a variety of sources. Once the information is gathered, use one of the following atlas sites to guide you in mapping your findings:

www.canadiangeographic.ca/atlas/,
www.atlas.nrcan.gc.ca/site/index.html

You may also choose an atlas from your school or community library to construct two maps showing:

• Distribution of the three populations comprising the total arctic and sub-arctic harp seal population.
• Migration routes of the Northwest Atlantic harp seals.

Estimated Populations
Visit the following sites or search for other sites to locate, analyze and conclude possible population estimates of harp seals.
http://www.yptenc.org.uk/docs/factsheets/animal facts/harpseal.html
http://www.harpseals.org/

Map 1
To locate information on the distribution of harp seal populations follow these links:
http://www.heritage.nf.ca/environment/breedingharp.html
http://www.imma.org/harpseal.html
http://www.sfu.ca/geog351fall02/gp2/wildlife/Harp%20Seal.html
To construct the map of distribution of harp seal population, follow the links
www.canadiangeographic.ca/atlas/
http://www.reisenett.no/map_collection/polar.html
Select an appropriate map and download. Colour the areas showing the distribution of three populations of harp seals 1. White/Barents Sea, 2. Greenland Sea and 3. Northwest Atlantic.

Map 2
Construct a map for the migration route of Northwest Atlantic harp seals population only.
The following links will assist with information on migration:
www.heritage.nf.ca/environment/breedingharp.html
www.qc.dfo-mpo.gc.ca/iml/en/produits/encart03.htm
Use the following links to find suitable maps:
www.canadiangeographic.ca/atlas/
www.worldatlas.com/webimage/countrys/polar/arcoutl.htm
Download an image and outline the migration route using a single colour indicate
the approximate location of harp seals for each season. For example, spring harp
seals are found off the coast of northeast Newfoundland and Gulf of St.
Lawrence.

Questions:

1. Name three separate harp seal populations in the Arctic and sub-Arctic region.

2. Based on your research, what is the estimated populations for:
   i. Northwest Atlantic ________________
   ii. White/Barents Sea ________________
   iii. Greenland Sea ________________

3. Briefly describe what you think are the benefits of tracking device placed on harp seals.

4. Write a short descriptive paragraph on the annual migration of the Northwest Atlantic harp seal.

5. What might happen to these patterns and populations if global warming continues?

6. How might changes affect those who have an economic dependency on these populations?
**Harp Seal: Population, Distribution and Migration**

**Assessment Rubric**

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Teacher: ________________________  

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Comments: