

# The Arctic Region—Living Near the Top of the World

(SR pages 98–113)

## Chapter Overview

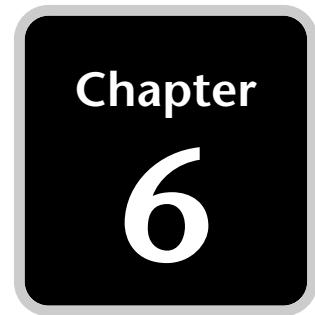
Chapter 6 begins by asking students to imagine life near the top of the world and to consider how the land and water influence ways of life in this region.

The Arctic region is unique in Canada for many reasons. It is a land where there are no trees and the ground is frozen for much of the year. The population is sparse, and many communities located alongside the Arctic Ocean receive food and supplies only by barge. Lifestyles typically combine traditional and modern elements, and stories and skills passed down through generations shape Arctic life. Many of the games that Inuit children play show a strong connection to the land and prepare children for daily activities in the north.

The climate in the Arctic has a major effect on quality of life. As the land is not suitable for farming and distances from many food sources are great, purchased food is expensive. The town of Inuvik in the Arctic's Northwest Territories has helped address this problem by building a community greenhouse. Students are also presented with information to help them understand how differences in the amount of sunlight and precipitation can affect communities in the Arctic and influence the kinds of activities undertaken.

This chapter examines the important question of global warming. The effects of climate change are emphasized through stories from Elders and photos that illustrate these changes. This becomes the basis for an Inquiry in which students are asked to consider what personal action they can take to slow down the effects of climate change.

The chapter concludes with a look at some of the natural resources found in the region. How are decisions made about Arctic lands and resources? The difficulty of balancing development with protecting the environment is illustrated through examination of the Mackenzie Pipeline project.



### Scheduling

Chapter 6 has five lessons, with several activities in each. It is not expected that all activities in each lesson be completed. Rather, teachers may choose from the activities given and adapt them to accommodate students' needs, scheduling requirements, and available classroom resources. To allow scheduling efficiency and flexibility, cross-curricular connections may be taken into account.

### In Advance

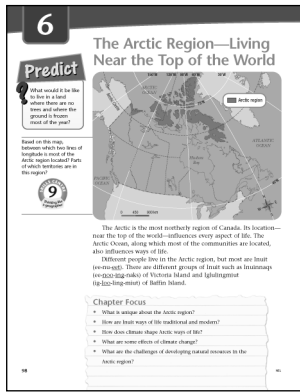
Collect examples of visuals of the Arctic region, including Inuit art, Arctic festivals, and Inuit children engaged in indoor and outdoor activities. Possible sources include *National Geographic* magazines, *Canadian Geographic* magazines, and web images. Start a file of current event articles on the Arctic. Look specifically for anything on global warming, polar bears, and the Mackenzie Pipeline. Send home copies of BLM 2, Letter Home: Regions of Canada.

## Chapter at a Glance

Teaching Resource and Student Resource Correlation	Outcome Links	Related Ancillaries, Lesson and Assessment Support
<p><b>6.1 What is Unique about the Arctic Region?</b> (SR pages 98–101) (TR pages 110–112)</p>	<ul style="list-style-type: none"> <li>• Value Canada's physical geography and natural environment (5.1.1)</li> <li>• Critically examine the physical geography of Canada (5.1.2)</li> <li>• Demonstrate skills of decision making and problem solving (5.5.4)</li> <li>• Develop skills of media literacy (5.5.9)</li> <li>• Demonstrate skills of oral, written and visual literacy (5.5.8)</li> <li>• Develop skills of geographic thinking (5.5.3)</li> </ul>	<p>Audio CD 1, Track 19: Barges Connect Us to the Mainland Audio CD 1, Track 21: Song of the Land Audio CD 1, Track 24: Nunavut Journal BLM 49, A View from the Top of the World BLM A21, Learning Along the Way BLM A22, Coaching Along the Way</p>
<p><b>6.2 How Are Inuit Ways of Life Traditional and Modern?</b> (SR pages 102–104) (TR pages 113–115)</p>	<ul style="list-style-type: none"> <li>• Value Canada's physical geography and natural environment (5.1.1)</li> <li>• Critically examine the ways of life of Aboriginal peoples in Canada (5.2.2)</li> <li>• Demonstrate skills of oral, written and visual literacy (5.5.8)</li> <li>• Apply the research process (5.5.7)</li> </ul>	<p>Audio CD 1, Track 22: A Dog Team Race BLM 50, Arctic Traditional and Modern Ways BLM 51, The Story of Pitseolak Ashoona BLM 52, Traditional Arctic Games BLM A21, Learning Along the Way BLM A22, Coaching Along the Way</p>
<p><b>6.3 How Does Climate Shape Arctic Ways of Life?</b> (SR pages 105–108) (TR pages 116–118)</p>	<ul style="list-style-type: none"> <li>• Value Canada's physical geography and natural environment (5.1.1)</li> <li>• Critically examine the physical geography of Canada (5.1.2)</li> <li>• Demonstrate skills of oral, written and visual literacy (5.5.8)</li> <li>• Apply the research process (5.5.7)</li> <li>• Demonstrate skills of decision making and problem solving (5.5.4)</li> <li>• Develop skills of geographic thinking (5.5.3)</li> </ul>	<p>Audio CD 1, Track 23: Snowmobiles Racing Activity Card 6, Amazing BLM 53, Climate Differences between the Arctic and Alberta BLM A73, Writing Rubric BLM A21, Learning Along the Way BLM A22, Coaching Along the Way</p>

## Chapter at a Glance

Teaching Resource and Student Resource Correlation	Outcome Links	Related Ancillaries, Lesson and Assessment Support
<p><b>6.4 What Are Some Effects of Climate Change?</b> (SR pages 109–111) (TR pages 119–121)</p>	<ul style="list-style-type: none"> <li>• Critically examine the physical geography of Canada (5.1.2)</li> <li>• Value Canada’s physical geography and natural environment (5.1.1)</li> <li>• Demonstrate skills of decision making and problem solving (5.S.4)</li> <li>• Develop skills of critical and creative thinking (5.S.1)</li> <li>• Demonstrate skills of oral, written and visual literacy (5.S.8)</li> <li>• Demonstrate skills of cooperation, conflict resolution and consensus building (5.S.6)</li> </ul>	<p>BLM 54, Critical Response Reading—Polar Bears and Polar Ice BLM A21, Learning Along the Way BLM A22, Coaching Along the Way</p>
<p><b>6.5 What Are the Challenges of Developing Natural Resources in the Arctic Region?</b> (SR page 112) (TR pages 122–123)</p>	<ul style="list-style-type: none"> <li>• Value Canada’s physical geography and natural environment (5.1.1)</li> <li>• Analyze how people in Canada interact with the environment (5.1.3)</li> <li>• Develop skills of media literacy (5.S.9)</li> <li>• Develop skills of critical thinking and creative thinking (5.S.1)</li> </ul>	<p>BLM 55, The Mackenzie Pipeline Controversy BLM 56, Identifying Multiple Perspectives BLM A21, Learning Along the Way BLM A22, Coaching Along the Way</p>
<p><b>Looking Back, Looking Forward</b> (SR page 113) (TR page 124)</p>		<p>BLM A23, Looking Back Student Rubric BLM A24, Looking Back Teacher Rubric BLM A66, Communicating My Ideas: Student Self-Reflection BLM A64, Reflections on My Learning BLM 7, A Special Place</p>



## CHAPTER 6, LESSON 6.1 (SR pages 98–101)

# What is Unique about the Arctic Region?

### Lesson at a Glance

	Values and Attitudes Links	Knowledge and Understanding Links	Skills and Processes Links	Assessment Support
<b>Introducing the Concepts</b>		Critically examine the major geographical regions, landforms and bodies of water in the Arctic (5.1.2.1)		BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Reading and Reflecting</b>	Appreciate the influence of the natural environment on the growth and development of the Arctic (5.1.1.5)	Critically examine the differences and similarities between regions of Canada (5.1.2.4)  Critically examine how the geographical region they live in is different from the Arctic (5.1.2.5)	Collaborate with others to apply strategies for decision making and problem solving (5.S.4.2)  Examine diverse perspectives regarding an issue presented in the media (5.S.9.2)	BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 1)</b>	Appreciate the geographic vastness of the Arctic (5.1.1.7)		Use cardinal and intermediate directions to locate places on maps and globes (5.S.3.4)	BLM 49, A View from the Top of the World BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 2)</b>	Appreciate the diversity of geographic phenomena in the Arctic Region (5.1.1.2)		Create visual images for particular audiences and purposes (5.S.8.4)	BLM A21, Learning Along the Way BLM A22, Coaching Along the Way

### Lesson Materials

Audio CD 1, Track 19: Barges Connect Us to the Mainland

Audio CD 1, Track 21: Song of the Land

Audio CD 1, Track 24: Nunavut Journal

BLM 49, A View from the Top of the World

Globe with lines of latitude and longitude  
Large poster paper circles (for “Arctic Circles”) – 1 per group

### Related Resources

See Appendix 6 for Supplementary print and audio/visual suggestions.

See Nelson Canada’s *Our Land and People* web site for links to history of the region, frequently asked questions, maps, and Arctic animals.

### In Advance

Gather a collection of Arctic visuals (postcards, posters, book illustrations)

## Introducing the Concepts

### Accessing Prior Knowledge

- Point out the Arctic Circle on the classroom globe.
- Organize students into groups and hand a paper “Arctic circle” to each group. Tell them that the term ‘Arctic Circle’ will be borrowed and applied to paper circles used for recording information.
- Ask students to fold their circle into four. In the centre of the circle, where the fold lines intersect, have them write “Arctic Summers” on one side of the

circle, and “Arctic Winters” on the other side. On each of the four quarters of the circle, they can then write four headings: ‘Bodies of Water’, ‘Landforms,’ ‘Precipitation,’ and ‘Temperature,’ leaving space to record data.

- Have students use *red* coloured pencils and bullets to record their prior knowledge about summer and winter conditions in the Arctic. They will be adding new knowledge in *green* to these charts as the chapter progresses.



#### TECHNOLOGY TIP

Use a graphics or computer drawing program to set up the Arctic Circle.



## Reading and Reflecting

- **Read page 98.** Have students locate the Arctic Circle on their map. Share with the class that this region is “near the top of the world” because of its closeness to the North Pole. Post and discuss the Predict question: *What would it be like to live where there are no trees and there is snow for most of the year?* Explain that much of the Arctic landscape was influenced by glacier formation during the Ice Age, as was also the case with the Canadian Shield. (See Activity 1.)
- **Read page 99.** Brainstorm how the Arctic region is unique (*e.g., islands with mountains and plains, long stretches of rocky treeless land, surrounded by sea ice, plants like lichens and mosses that can grow above the treeline, unique animals such as Arctic fox and muskox*). Have students compare what life would be like in the Arctic to their life in Alberta using a T-chart or Venn diagram. (See Activity 2.) Students can also use BLM 6, Vocabulary Chart to add new terminology they are learning in this chapter.
- Record on chart paper the challenges posed by sea ice (*e.g., dangers to animals and humans because of the weight-bearing instability of the ice early and late in the ice season, dangers to shipping*). Discuss the differences between fertile and barren plains. (*Fertile plains have plants, animals; barren plains have neither.*) Ask why there is so little vegetation in the area, and why this would be a problem for farming. (*Long, very cold winters and short summers; harsh winds; rocky soil; arid conditions; permafrost prevents deep root development and inhibits vegetation. However, game is plentiful.*)
- **Read page 100.** Explain how the traditional means of travel (*e.g., qajait [kayaks] and umiaqs*) shows the Inuit understanding of the land. (*Transportation was made of natural resources, and was developed for hunting.*) What features of kayaks make them good for hunting? (*They can be carried easily, float well, can be paddled silently and quickly to follow animals, and are designed to keep hunters warm and dry, and are waterproof.*)
- Ask students to Think, Pair, Share answers to the following questions: What challenges exist when travelling by water in the Arctic? (*Sea ice blocks water routes much of the year; great distances between communities; only three months are available for open water travel, boats are expensive, and few have their own boats.*) What challenges exist when travelling by land? (*Distances, lack of roads between communities, impossibility of using snowmobiles or even all-terrain vehicles in summer, cost of fuel.*)
- **Read page 101.** Ask students to identify the opposing perspectives in the “Reflections” news article “Celebrating the Return of a Way of Life.” They can use a graphic organizer to note the issue and the two points of view. Share ideas in a class discussion.



- Discuss possible answers to the Pause question on quality of life (e.g., *A valuable source of organic food was no longer available, communities lost an opportunity to celebrate and share, a connection with the past was lost*).

## Developing and Applying the Concepts



### Activity 1: Considering a Different View

- Hand out BLM 49, A View from the Top of the World.
- Explain that this map is actually a depiction of the top of the globe and this is why it might appear somewhat distorted from their perspective.
- Take up answers as a class. (1. *All directions are south, facing away from the North Pole.* 2. *Canada, United States (Alaska), Denmark (Greenland), Norway, Sweden, Finland, Russia.*)
- Discuss the topic of ice cap shrinkage and explain that it is an issue of global concern.

### Activity 2: Getting a Sense of the Arctic

- Write the question “What does the Arctic look like?” on the board.
- Ask students to view visuals of this region and respond individually to the question.
- Students can also record newly acquired information in *green* on their ‘Arctic Circles.’

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#### Differentiated Instruction

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This response may be in one of a variety of forms, such as drawings, word descriptions, or talking about the Arctic visuals.

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#### Alternate Activity

As students listen to Susan Aglukark’s “Song of the Land”, ask them to describe what this song tells them about the relationships between land and people.

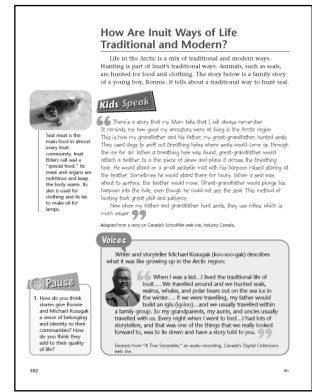
### Working Toward the Main Ideas

- What are some unique characteristics of the geography of the Arctic region?
- How do challenges shape ways of life in Arctic communities?

# How Are Inuit Ways of Life Traditional and Modern?

## Lesson at a Glance

	Values and Attitudes Links	Knowledge and Understanding Links	Skills and Processes Links	Assessment Support
<b>Introducing the Concepts</b>		Critically examine the differences and similarities between the regions of Canada (5.1.2.4)		BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Reading and Reflecting</b>	Appreciate how the land sustains communities and the diverse ways that people have of living with the land (5.1.1.4)	Critically examine what the stories of Inuit peoples tell us about their beliefs regarding the relationship between people and the land (5.2.2.1)		BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 1)</b>	Appreciate the diversity of geographic phenomena in Canada (5.1.1.1)	Critically examine the ways in which anthropology and archaeology contribute to our understanding of Inuit peoples (5.2.2.5)	Select appropriate forms of delivery of written and oral information, taking particular audiences and purposes into consideration (5.5.8.1)	BLM A70, Role-Playing Rubric BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 2)</b>		Critically examine how Aboriginal cultures and ways of life are unique in the northern region of Canada (5.2.2.2)	Use a variety of technologies to organize and research information (5.5.7.10)	BLM A21, Learning Along the Way BLM A22, Coaching Along the Way



### Lesson Materials

- Audio CD 1, Track 22: A Dog Team Race
- BLM 50, Arctic Traditional and Modern Ways (1 per pair of students)
- BLM 51, The Story of Pitseolak Ashoona
- BLM 52, Traditional Arctic Games
- Arctic Circles from Lesson 6.1
- One die per pair of students, counters or beans for the whole class
- Visuals of art of Pitseolak Ashoona

### Related Resources

See Appendix 6 for supplementary print and audio/visual suggestions.

See Nelson Canada's *Our Land and People* web site for information related to traditional lifestyles and artwork of Inuit artist Pitseolak Ashoona.

### In Advance

- Arrange computer time for students to view online the work of Pitseolak Ashoona
- Collect visuals of children playing traditional games in the Arctic.
- Plan to play some traditional Inuit games (See BLM 52, Traditional Arctic Games)

## Introducing the Concepts

### Identifying Prior Knowledge

- Ask students to brainstorm the meaning of the words “traditional” and “modern.” (*Traditional is the adjective from ‘tradition’ meaning a custom, opinion, or belief handed down through generations; modern is of the present or of recent times.*) Give and ask for examples.
- Share with the class that they will be playing a short game to determine their prior knowledge of Inuit ways of life.

### Note

This activity will appeal particularly to kinesthetic learners.



- Ask each student to find a partner. Hand out one copy of BLM 50, Arctic Traditional and Modern Ways for each student pair. The students are to cut out the pieces and put them face down.
- Each student rolls a die. The partner with the *higher* number chooses the category, either “Traditional” or “Modern.” The partner with the *lower* number then chooses a card from the pile (e.g., *Winter Land Transport*). The higher-numbered partner has to give an example in the chosen category (e.g., *Traditional Winter Land Transport – dog sled*). The other partner then provides an example from the opposite category (e.g., *Modern Winter Land Transport – snowmobile*). Each student giving a correct example wins a counter. The student with the most beans or counters is declared the winner.
- The game can be played again at the end of the lesson or chapter so that students can see how much they have learned.

## Reading and Reflecting

### Related Resources.

See Appendix 6 for a list of stories by Michael Kusugak to share with the class.



- **Read page 102.** Conduct a class discussion on Ronnie’s story. Ask what is traditional. (*The way of hunting with harpoons, the way information is passed on through stories.*) What is modern? (*Hunting with rifles.*)
- Ask students how Michael Kusugak’s traditional Inuit upbringing has shaped his life. Why is it important to know both traditional and modern ways? (*Often traditional and modern ways are combined; understanding traditions helps develop an understanding of why things happen today; communities might need or wish to return to traditional ways of doing things.*)
- Have the class Think, Pair, Share their opinions of the role of stories in shaping an identity. (e.g., *Stories provide links to previous generations and are interesting. They add to the quality of life by being enjoyable, and increasing communication between generations. Youngsters can respect the wisdom and knowledge of Elders.*) (See Activity 1.)
- **Read page 103.** Conduct a short raised-hands survey. Ask students how they know how to get to different places. (e.g., *Knowing where to go because of familiarity, seeking the advice of others, using maps, using GPS or other modern technologies, using signposts such as inuksuks.*) Point out that modern technologies are safer and make communication easier; however, many Inuit still value traditional ways. Arctic ways of life and values are often still the same. Hunting and fishing are still a way of life and many families and communities have the same traditional values, even though their ways of doing things might be modern and technologically-based.
- Take up the Pause questions. Pause 1: (*Modern technologies such as GPS systems and phones with satellite imaging are helpful for travellers in identifying locations in cases of emergency and inclement weather. However, such systems are costly. Snowmobiles are also expensive and need fuel and upkeep. However they are easy to use and don’t need the continual care that dog teams do.*) Pause 2: (*Inuksuks are traditional signposts that are common throughout the Arctic. Their individual meanings are varied but inuksuks have often made the difference to survival success. They are relatively unique to the Arctic area and have become symbolic of Arctic identity.*)
- **Read page 104.** Ask how traditional Inuit games are important to quality of life in the north. (*They preserve the distinctiveness of northern ways of life, they*

*are fun and help break up long winter periods, they develop skills necessary for hunters.)*

- Share with students that the Arctic Winter Games have been held annually in different northern cities since their beginnings in Yellowknife in 1970. Since Dene and Inuit traditional games are mixed with such modern events as snowboarding, speed skating, and ice hockey, the Annual Winter Games help preserve the distinctiveness of northern ways of life. (See Activity 2.)

## Developing and Applying the Concepts

### Activity 1: Role-Playing an Anthropologist

- As a class, examine some of the work of Inuit artist Pitseolak Ashoona. Invite students to comment on what they see in her art. Discuss what can be learned about Inuit lifestyle and culture from these images.
- Organize the class into groups of three. Hand out BLM 51, The Story of Pitseolak Ashoona or have three students read this for the class.
- Provide a definition of an anthropologist (*a person who studies human beings, especially their societies and customs [Canadian Oxford Dictionary]*). Ask students to discuss the following questions with a partner: Are artists like Pitseolak anthropologists? Why or why not? Does an anthropologist need university training? Why?
- Ask students to take on the role of an anthropologist and present in character (with costumes and props to assist them) what they have learned about Inuit society through examining Inuit art and participating in the Pitseolak Ashoona Readers' Theatre.
- You can use BLM A70, Role-Playing Rubric to assess student performance.

### Activity 2: Learning about Inuit Games

- Examine visuals of children playing traditional Inuit games. Ask the class to make observations about these games. (*e.g., They are often cooperative, use natural materials such as bone or hide, often based on strength and skills, designed to be portable or played in cramped spaces such as iglus*). Ask why some traditional games are designed to develop skills such as strength, dexterity, and speed. (*These skills are needed for physical fitness, for hunting prowess, and for safety and survival.*)
- Have students add any information they have learned from visuals or online searches to their Arctic Circles.
- Then distribute BLM 52, Traditional Arctic Games, which features games that are easy to play in the gym or playground.
- Students can take turns teaching the class these traditional Inuit games. This will contribute to their appreciation and understanding of Inuit culture.

### Working Toward the Main Ideas

- Why is it important to the Inuit people to combine traditional and modern ways of living?
- How do we know about the past of the Inuit people?

### Background Note

Prior to First Contact (approx. 2000 BCE to 1700 CE), Inuit carvings were typically made from ivory or less commonly bone, antler, or wood. Images were often of masks, human figures, land and sea animals, and birds. Contemporary Inuit art includes printmaking, drawing, and fabric wall hangings as well as traditional carvings.

See Nelson Canada's *Our Land and People* web site for examples of art work by Pitseolak Ashoona.

### Note

This activity will appeal particularly to kinesthetic learners.



### TECHNOLOGY TIP

Be as specific as possible in your wording when using search engines on the Internet. This will ensure a closer match between what you are looking for and what appears on the screen.



### LITERACY LINK

Briefly review the process for giving oral instructions, e.g., a step-by-step sequence of directions.

## CHAPTER 6, LESSON 6.3 (SR pages 105–108)

# How Does Climate Shape Arctic Ways of Life?

**How Does Climate Shape Arctic Ways of Life?**

Winters are long and cold throughout the Arctic region. Winter temperatures are influenced by cold air masses from the Arctic Ocean. In the summer, warm air masses flow up from the Indian Plateau or the Pacific Ocean and temperatures can be warm. However, the summer season is very short and the temperatures can dip at any time. It is not uncommon to get snow in July and August. The farther north a place is, the colder it tends to be throughout the year.

While it is cold in the Arctic region, there is little snow in some areas. Much of the Arctic region is actually considered a tundra — desert because it gets very little precipitation. However, the Arctic is a large region and the amount of precipitation varies depending on location. For example, precipitation averages between less than 40 millimetres a year in Inuvik to more than 400 millimetres a year in Igloolik (see below). The mountain landscapes receive more precipitation than other areas. However, in the valleys there is little precipitation during the summer months. These areas can have very dry or drought conditions.

**Skills to Work**


Read, think, explain, and show how the climate of the Arctic region is similar to and different from the region where you live.

**Pause**

Think and communicate: Write or sketch to explain the ways of living that a key Arctic community has developed. How are these ways of living different from the ways of living in your community? Why?

**Pause**

Think and explain: How do you think the ways of living that a key Arctic community has developed are different from the ways of living in your community? Why?





### Lesson at a Glance

	Values and Attitudes Links	Knowledge and Understanding Links	Skills and Processes Links	Assessment Support
<b>Introducing the Concepts</b>		Critically examine how the geographical region they live in is different from the Arctic (5.1.2.5)	Collaborate with others to apply strategies for decision making and problem solving (5.S.4.2)	BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Reading and Reflecting</b>	Appreciate the influence of the natural environment on the growth and development of the Arctic (5.1.1.5)		Construct maps, diagrams and charts to display geographic information (5.S.3.2)	BLM 17, Factors Influencing Climate BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 1)</b>	Appreciate how the land sustains communities and the diverse ways that people have of living with the land (5.1.1.4)	Critically examine how the geographical region they live in is different from the Arctic (5.1.2.5)	Use data gathered from a variety of electronic sources to address identified problems (5.S.4.4)	BLM 53, Climate Differences between the Arctic and Alberta BLM A21, Learning Along the Way BLM A22, Coaching Along the Way BLM A73, Writing Rubric
<b>Developing and Applying the Concepts (Activity 2)</b>		Critically examine the differences and similarities between the regions of Canada (5.1.2.4)	Access and retrieve appropriate information from the Internet by using a specific search path (5.S.7.6)	BLM A73, Writing Rubric BLM A21, Learning Along the Way BLM A22, Coaching Along the Way

## Introducing the Concepts

### Setting the Context

- Ask which day of the year has the most daylight (*June 21*) and which has the least (*December 21*). Invite students to share experiences relating to the amount of daylight experienced at these times of the year. (*e.g., Waiting for darkness before lighting mid-summer fireworks but falling asleep before it grew dark; playing shinny hockey outdoors during winter break when it was too dark to see the puck.*)

- Explain that in the north, daylight is even longer in the summer and shorter in the winter. Have students create a cause-and-effect chart to predict how these daylight differences might affect northern communities.



## Reading and Reflecting

- **Read page 105.** Ask students to raise their hands if they think that the Arctic has a great deal of snow in winter (*In some regions of the Arctic there is very little precipitation in the form of snow or rain.*)
- Have students examine the text and pictures in order to complete their winter comparison Venn Diagram. They can also revisit the “Factors Influencing Climate” BLM chart they originally began in Chapter 1, adding information on air masses and ocean currents in the Arctic region. Share student ideas on how climate affects how people live. Ask why festivals are so important in the Arctic (*for entertainment, to celebrate seasons, as a focus for gathering families and friends, to boost spirits after a long cold winter season*).
- **Read page 106.** Review why food is so expensive in the Arctic Region. (*The climate and permafrost prevent crops from growing; domestic livestock aren't suited to the climate conditions, so meat is dependent on hunting; huge distances and lack of roads make transportation costs very high.*) (See Activity 1.)
- Ask the class what difficulties their family would encounter if: a) the bulk of their food supplies came only once or twice a year? and b) they were dependent on good weather to have their food delivered? (*Extra cost because of transport; difficulties in making a list to cover a year's supply of goods ahead of time; not having replacements in case of spoilage; missing or forgotten items can't be replaced easily; if somebody became sick and needed special foods, these items couldn't be delivered until the next shipment; need for large storage space.*)
- Read “People and Places: The Story of Inuvik.” Make a T-chart on the board and write “Overcoming Geography” as the title. On one side write a subheading “Geography”, and on the other side write “Greenhouses.” Ask students for characteristics of the land that make food growing difficult or impossible. Write these under “Geography.” Ask how a greenhouse changes the environment so that these difficulties are overcome. (*e.g., Geography—permafrost; Greenhouse—insulation makes warmer soil.*)
- **Read pages 107–108.** Discuss how differences in daylight would affect students and schools (*e.g. summer – students tired because of sleeping difficulties when it is light outside; hot school rooms; winter – need for extra heat and light; students with seasonal affective disorder*). Review the “Thinking Like a Geographer” feature. Ask students what determines the amount of sunshine or darkness. (*Degrees of latitude.*) Ask what information they would need to compare their hours of sunshine (daylight) to that in Resolute Bay. (*Their own latitude, a source for the information.*)
- Have students study the seasonal calendar on page 108 to explain why there are months when animals are not hunted. (*They are mating or having their young.*) Why are the months in which animals aren't hunted different from animal to animal? (*Different animals have different lengths of time before their babies are born.*) Why are caribou hunted year round? (*They are a basic food supply and are more plentiful in numbers.*)



### TECHNOLOGY TIP

Have students contact Environment Canada or search online climate and weather sources for information about daylight and latitude.



## Developing and Applying the Concepts



### Activity 1: Considering How Climate Influences Quality of Life

- Write the following headings on the board: Food, Household Water, Warmth.
- Distribute to the class BLM 53, Climate Differences between the Arctic and Alberta.
- Ask students to consider how these three aspects of daily living are affected by the Arctic climate. They may use information from their Student Resource, other reference texts, and computer web sites to help them. Then ask them to compare living in the Arctic to living in their region of Alberta.
- When students have finished writing responses on their BLM, compare and contrast the two regions in a class discussion. Jot down information for each region under the appropriate headings. (Possible answers for the Arctic are provided below.)
  - **Food**—*The climate is not suitable for farming. Fresh fruit and vegetables and processed food must be shipped by air or water. The price of milk is about four times its cost in Edmonton or Calgary. Pop is more than twice its cost in Alberta cities. Food often must be ordered in large quantities, for delivery once a year. There are some indoor gardens in towns such as Inuvik. Hunting and berry gathering are natural sources of food, which supply needed vitamins (particularly Vitamin D, which is in short supply during winter months when there is little daylight).*
  - **Household Water**—*As underground pipes would freeze, water and sewage are stored in indoor storage tanks. These are serviced by trucks. Some communities have above-ground pipes running through insulated structures called utilidors.*
  - **Warmth**—*Heating is expensive because of transportation costs and year-round cold temperatures. Homes are set above ground to prevent melting of the permafrost and sinking. Traditional outdoor clothing is sometimes made from skins of seal or caribou. More often, though, wool duffel parkas are worn.*

#### Alternate Activity

You could have students work on Activity Card 6: Ulukaktok: A Vibrant Northern Community. For Activity 2 in the card, refer students back to the circular calendars in the Student Resource (Chapter 1 page 19; Chapter 2, page 39; and Chapter 6, page 108). Remind them that Aboriginal peoples see time as cyclical rather than linear. Time is measured through the cycle of changes in nature, which shape the activities that people do.

### Activity 2: Understanding How Latitude and Daylight Hours Affect Arctic Living

- Review with the class how latitude influences the hours of daylight for any place in Canada. (e.g., *Knowing the degree of latitude helps you to determine how many hours of daylight there are during the summer or winter. The further north a location is, the higher the degree of latitude (up to 90° N) and the fewer the hours of daylight in the winter.*)
- Ask students to write a reflective paragraph to explore the impact of limited daylight hours in midwinter on people in the Arctic. (e.g., *Seasonal affective disorder, fewer hours to get jobs done in daylight, need for extra artificial light, which is expensive.*)
- You can use BLM A73, Writing Rubric to assess student paragraphs.



#### LITERACY LINK

Explain to the students the importance of setting a context for their reflective paragraph.

### Working Toward the Main Ideas

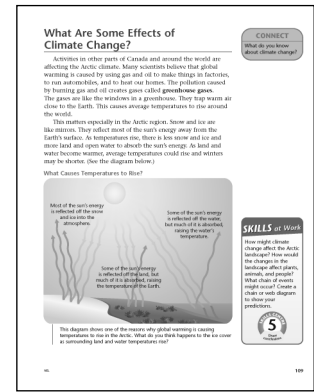
- What factors affect the climate in the Arctic?
- How are people affected by the Arctic climate in both summer and winter?

CHAPTER 6, LESSON 6.4 (SR pages 109–111)

# What Are Some Effects of Climate Change?

## Lesson at a Glance

	Values and Attitudes Links	Knowledge and Understanding Links	Skills and Processes Links	Assessment Support
<b>Introducing the Concepts</b>	Appreciate the diversity of geographic phenomena in Canada (5.1.1.2)		Use data gathered from a variety of electronic sources to address identified problems (5.S.4.4)	BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Reading and Reflecting</b>		Critically examine the factors which determine climate in the Arctic region (5.1.2.6)		BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 1)</b>	Appreciate the influence of the natural environment on the growth and development of the Arctic (5.1.1.5)		Analyze significant local and current affairs from a variety of sources (5.S.1.1)	BLM 54, Critical Response Reading—Polar Bears and Polar Ice BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 2)</b>	Demonstrate care and concern for the environment through their choices and actions (5.1.1.6)		Create visual images for particular audiences and purposes (5.S.8.4) Demonstrate commitment to the well-being of the community (5.S.6.1)	BLM A71, Poster Rubric BLM A21, Learning Along the Way BLM A22, Coaching Along the Way



### Lesson Materials

- BLM 54, Critical Response Reading—Polar Bears and Polar Ice
- BLM A71, Poster Rubric
- Highlighter or a brightly coloured pencil for each student
- Classroom calculators
- Poster paper for students
- Arctic Circles from Lesson 6.1

### Related Resources

See Nelson Canada's *Our Land and People* web site for information about global warming, the "greenhouse effect," and climate change.

## Introducing the Concepts

### Setting the Context

- Tell students that they will conduct a short survey on climate change.
- Ask volunteers to come to the board to act as survey administrators. They will read the class the following questions and ask for a show of hands:



1. Who would like to have a longer season of summer?
  2. Who would want freezing to happen later in the year than normal?
  3. Who would appreciate having higher temperatures in winter?
  4. Who wants to have higher temperatures in summer?
- Ask administrators to count and record survey responses.
  - Tell the class that they will be asked these questions again later to see if their answers change because of new information.

## Reading and Reflecting



- **Read page 109.** Create a class definition of “global warming” (*e.g., An increase in temperature of the Earth’s atmosphere*). Share prior student knowledge and opinions on the topic.
- Ask the class, what would provide evidence of global warming? (*e.g., Increased average annual temperatures; increased melting of glaciers and sea ice in the Arctic and Antarctica; increased sea temperatures; holes in the ozone layer; shrinking wetlands; changing plant habitat; more storms, freezing rain covering Arctic plants and making it difficult for caribou and musk oxen to remove food from the ground.*)



- **Read page 110.** Ask, what problems do polar bears have because of climate change? (*Problems adjusting to increasing temperatures when they have adapted to cold weather; loss of the ice as a hunting platform; loss of food as they are unable to kill in the water; loss of seals and walrus as their basic food supply if these animals do not have enough to eat.*)
- Discuss the Inuk Elder’s thoughts and concerns [see Voices]. (*e.g., The supply of caribou will decline if they cannot cross the channel; accumulated knowledge about the land and the waters is becoming less useful in light of major environment changes; climate change is upsetting the balance of nature.*) Discuss whether personal human observations are as valid as scientific data in providing evidence of climate change.
- **Read page 111.** Have students work with a partner to create a Cause-Event-Effect diagram showing the multiple effects climate change can have on the environment. (See Activity 2.)

### Cross Curricular Connections Math

Ask students to use their calculators to work out how much money would be saved if every student in the class, and then in the school, saved a penny a day by reducing their use of energy in some way.

### Sensitivity Note

The title of the first article may be jarring for some students. Prepare them with a short discussion on dwindling polar bear food supply in the Arctic.



### LITERACY LINK

As students read the excerpts, ask them to underline important points and make jot notes.

## Developing and Applying the Concepts

### Activity 1: Analyzing an Important Issue

- Set the context for this activity by explaining some reasons for the shrinking of polar ice (*e.g., Natural cycles as Ice Ages have come and gone; the ice caps are now 14 per cent smaller than in the late 1970s, open water absorbs more of the sun’s heat than ice does.*)
- Distribute BLM 54, Critical Response Reading—Polar Bears and Polar Ice, and ask students to complete the questions independently.
- Come together as a large group to discuss the answers.
- Ask and answer other questions that arise from students’ reading. The articles state that polar bears and the Inuit are being affected by the loss of polar ice.

Which other animals are being affected? (e.g., *Animals that have their young on the ice, such as seals and walrus.*)

- Have students add any new information to their Arctic Circles with green pencils.

## Activity 2: Becoming a Local Activist

- Explain that it is hard for individuals in a cold-climate country like Canada not to want an increase in local temperatures. In comparison, increases in temperatures for hot climate countries can be disastrous. (E.g. *water sources can evaporate, crops can wither, animals become stressed or can die because of the heat, air conditioners increase energy consumption.*)
- As a precursor to the next activity, revisit the questions asked earlier in “Setting the Context.” Redo the survey. Has there been any change in student thinking? Why?
- Ask the class to problem-solve in small groups ways to slow down climate change. (e.g. *walking instead of driving places; using public transit instead of cars; turning off lights, computers, and television when you leave a room; composting our organic waste, using renewable energy resources such as wind and solar power to produce our electricity.*)
- Have the groups create a cause-and-effect chart linking the proposed strategies to beneficial outcomes (e.g., *walking instead of driving reduces the use of fossil fuel, which in turn reduces the amount of greenhouse gases heating Earth’s atmosphere.*)
- Then individually, ask students to collect ideas to prepare their personal action poster on ways to slow down global warming. Remind them to consider their role, audience, and the context for this task.
- You can use BLM A71, Poster Rubric to assess student posters.

## Working Toward the Main Ideas

- How is climate change affecting the environment?
- How can students take responsibility to slow down global warming?
- What consequences will there be if people worldwide don’t slow down global warming?

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## Differentiated Instruction

Have students create a mind map or line drawing to show their understanding of the main message in these articles.

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## Background Note

When atmospheric warming melts the soil in the Arctic region, it increases sediment erosion and water level in ponds and lakes. In addition to causing problems for the ecosystem and surrounding animals, this thaw releases billions of tonnes of methane gas previously trapped in the frozen ground.



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## Extension

Students may wish to produce an infomercial to present the information they have gathered or write a persuasive letter to a company asking them to use less packaging in their products.

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## CHAPTER 6, LESSON 6.5 (SR page 112)

# What Are the Challenges of Developing Natural Resources in the Arctic Region?

**What Are the Challenges of Developing Natural Resources in the Arctic Region?**

Natural resources are attracting many people and companies from southern Canada to the Arctic region. The Arctic region has deposits of minerals, such as silver, lead, zinc, and diamonds. There are also large deposits of oil and natural gas beneath the Beaufort Sea. Companies are exploring the Arctic region to find these resources. Some are also preparing to build a new gas pipeline from the Mackenzie Delta in the Arctic region to Alberta. This project is expected to bring many jobs to the region. It also brings with it more changes to the environment and ways of life. A challenge for the future of the Arctic region and its people will be balancing development with protecting the environment and ways of life.

**Some New Resources of the Arctic Region**

Oil and gas drilling could affect the beautiful culture and way of life. Pipelines will be needed to carry the oil and gas to other parts of Canada. Controversy has arisen because of the risk of oil spills that could harm the environment.

**Pause**

1. Why do you think it is important for all people who live in this area to be involved in the decision making about the use and protection of resources?

### Lesson at a Glance

	Values and Attitudes Links	Knowledge and Understanding Links	Skills and Processes Links	Assessment Support
<b>Introducing the Concepts</b>	Appreciate the diversity of geographic phenomena in Canada (5.1.1.2)		Collaborate with others to apply strategies for decision making and problem solving (5.S.4.2)	BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Reading and Reflecting</b>	Appreciate the influence of the natural environment on the growth and development of Canada (5.1.1.5)	Appreciate how the land sustains communities and the diverse ways that people have of living with the land (5.1.1.4)	Determine when a decision needs to be made in dealing with problems and issues (5.S.4.1) Critically evaluate ideas, information and positions from multiple perspectives (5.S.1.2)	BLM A21, Learning Along the Way BLM A22, Coaching Along the Way
<b>Developing and Applying the Concepts (Activity 1)</b>	Appreciate how the land sustains communities and the diverse ways that people have of living with the land (5.1.1.4)	Critically examine how natural resources are used, exchanged and conserved in Canada (5.1.3.2)	Examine diverse perspectives regarding an issue presented in the media (5.S.9.2) Re-evaluate personal opinions to broaden understanding of a topic or an issue (5.S.1.3)	BLM 55, The Mackenzie Pipeline Controversy BLM 56, Identifying Multiple Perspectives BLM A21, Learning Along the Way BLM A22, Coaching Along the Way

## Introducing the Concepts

### Setting the Context

- Ask the class how traditional natural resources like water and animals were used in the Arctic (*e.g., as a source of food; oils as a source of heat and light; bones as material for carving and weapons, skins used for clothing.*) Share with students that after the Europeans came to the region a number of changes occurred. (*e.g., Animals became used for trading and clothing; weapons changed; mineral deposits were discovered and developed.*)
- Ask how natural gas is used. (*e.g., heating buildings; as a fuel for manufacturing purposes; used in refineries.*) Why is it important that we have continuous supplies of this natural resource? (*e.g., need for heat in a cold climate; need for manufactured goods and refinery products.*)

- Have students create a Plus-Minus chart with a partner to identify how this development has affected Arctic ways of life. (*e.g., Traditional animal food sources have been affected; many foodstuffs are now bought; families are now reliant, or partially reliant, on paid employment.*)



## Reading and Reflecting

- **Read page 112.** Ask why obtaining oil and gas from the Beaufort Sea is important. (*e.g., We need oil and gas for our vehicles and to heat our houses; some sources of oil and gas are running low; more oil and gas on the market will lower prices.*) (See Activity 1.)
- Ask students to use the map to visually follow the route of the Mackenzie Pipeline. Brainstorm as a large group where the oil would be going. How could students find out this information? (*e.g., Contact the Department of Northern Affairs, Department of the Environment.*) What words would be needed to start an online search? (*e.g., Mackenzie Pipeline, Arctic map.*)



## Developing and Applying the Concepts

### Activity 1: Considering Multiple Perspectives

- Share with the class that they will be examining different opinions on the Mackenzie Pipeline project.
- Hand out BLM 55, The Mackenzie Pipeline Controversy. In groups of three, ask students to read the handout and identify the three opinions presented. Then have one member from each group choose a different opinion to explain to their group. Students can briefly outline the three viewpoints as well as their own opinion where indicated on the handout.
- Before you begin the second part of this activity, discuss the concept of multiple perspectives. Write on the board: Perspectives – *Environmental* (involving animals and their natural habitat); *Economic* (involving money and jobs); *Cultural* (involving ways of life); *Historical* (involving traditions and history). Reinforce that whenever choices are made about how land and resources are used, all these perspectives need to be taken into account. Point out, as well, that cultural and historical perspectives are closely linked.
- Hand out BLM 56, Identifying Multiple Perspectives and ask students to read the material presented. Using what they already know as well as any information from independent research, ask students to determine the four perspectives and write them down.
- At the end of the two-part activity, share with students any articles you have collected on the Mackenzie Pipeline and update them on recent announcements. Discuss as a class what progress has been made and predict what issues still present potential problems.

### Working Toward the Main Ideas

- What new and traditional natural resources are found in the Arctic?
- How have natural resources affected ways of life in the Arctic, in the past and today?
- Who should have input into decisions about Arctic lands and resources?

### Background Note

In January 2007, Imperial Oil Resources Ventures Limited reached a tentative agreement with the Government of the Northwest Territories on the Mackenzie Gas Project. Commitments have been made by the parties involved relating to sustainable development, cultural preservation, employment, oil and gas training, transportation, and safety and security. Details on the pipeline route are still being finalized.

### Differentiated Instruction

Students may work in pairs to identify and explain the four perspectives. Group students of different ability levels together so the stronger students can assist those for whom the content is more challenging. If students are having trouble getting started, this could be a teacher-directed activity.

# Looking Back, Looking Forward

(SR page 113)

## Looking Back

Students are offered three possibilities to choose from to demonstrate their understanding about living in the Arctic Region: a tourist advertisement, a song, or a web page for students in lower grades. In each case, they should relate their product to the Predict question for this chapter: *“What would it be like to live in a land where there are no trees and where the ground is frozen most of the year?”*

Share BLM A66, Communicating My Ideas: Student Self-Reflection and BLM A23, Chapter 6: Looking Back Student Rubric with the class before beginning this activity. Discuss the characteristics of a good product with the class as well.

- **Advertisement:** Before creating their advertisement, students should think about how to capture the “essence” of the Arctic. They could consider the unique landforms, and Inuit festivals such as Toonik Tyme or Umingmak Frolics, and reflect on how these influence ways of life in this region. It is also important to decide to whom their ad is directed (e.g., tourists, businesses, government leaders) and where their advertisement will be placed (e.g., television, magazines, newspapers, on buses.) This will help them determine their target audience and the type of advertisement they want to create.
- **Song:** Students choosing this product option can gather as a group to brainstorm types of songs (e.g., ballads telling a story, lyrical songs expressing a strong emotion), the mood they wish to create with their song (contemplative, upbeat), and the tempo. They may wish to listen again to “Song of the Land” to help them get started. Students can select background music that fits their lyrics or, if they play an instrument, work out a tune and accompany their song themselves.
- **Web Page:** This option is available for more technically minded students. In advance of creating a web page, direct students to sample web pages so that they understand basic features (e.g., headings, subheadings, content within each section, and accompanying images). Remind them to select headings and images consistent with what they learned about Arctic life. Since this is an information source for younger students, it should be simply worded with a number of visuals to illustrate the content.

## Checking in: Take Another Step Toward Your Performance Task

Allow students time to complete BLM A64, Reflections on My Learning for this chapter. Distribute BLM 7, A Special Place to help them record information on the Arctic region.

## Build the *Travel Canada* Tour

Encourage the class to review the folders they have created for the geographic regions of Canada. Allow time for students to assemble final information on their six locations. Collect *Travel Canada* performance task submissions.