1

Explore the Land

I magine walking through a grassy field in the foothills of southern Alberta. In the distance, you can see the Rocky Mountains. Suddenly you spot something up ahead. As you walk closer, it gets bigger and bigger. It looms over you, as big as a three-storey building. It's a rock—a *big* rock! What is a huge rock doing in the middle of an empty field? Where could it have come from? Why is it here?

What you see is "Big Rock," outside the town of Okotoks. Big Rock is unlike any of the rocks around it. It is made of quartzite, a type of rock found in the mountains. In fact, it has travelled hundreds of kilometres to get where it is now!



Alberta's Story

You must be wondering how Big Rock got to where it is now. In this chapter, you'll find out about Big Rock and other stories of the land in Alberta. You'll learn that, millions of years ago, the land did not look like it does now. It changed over time, and was shaped in a way that makes Alberta unique. You'll also explore the different parts or regions of Alberta as they are today.

? Inquiring Minds

Here are some inquiry questions to keep in mind while exploring this chapter:

- How have the unique land features of Alberta been shaped over time?
- What is it like living in each of the regions of Alberta? Look for answers in this chapter.

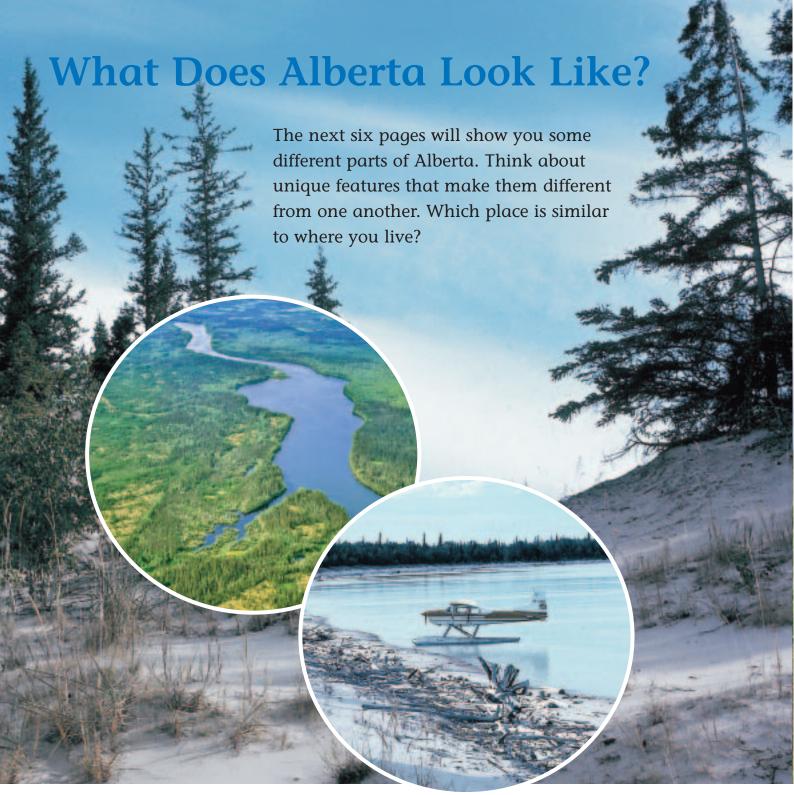
Mount Columbia is the highest mountain in Alberta. Why does Alberta have mountains?

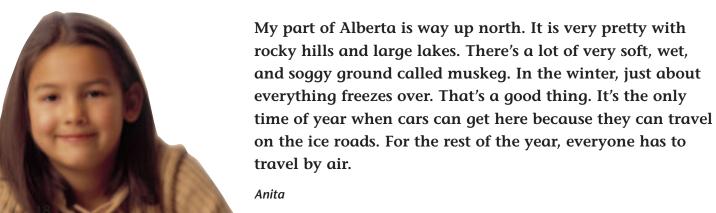
Alberta has sand dunes! They are at Lake Athabasca. I wonder where this sand came from. The area near High Level is good for growing crops. I wonder why.













Thinking *It Through*

Compare the pictures on these two pages.

- How are these two parts of Alberta different?
- How are they similar?

Where I live, there are lakes and rivers, but mostly thick forests. There are also wet muddy marshes with tall grasses growing in them. There must be something just right about our marshes and lakes because in April the very rare trumpeter swans come to nest. We also have some farmland. The swans often stop and rest in the farmers' fields—especially when the rain has flooded them.







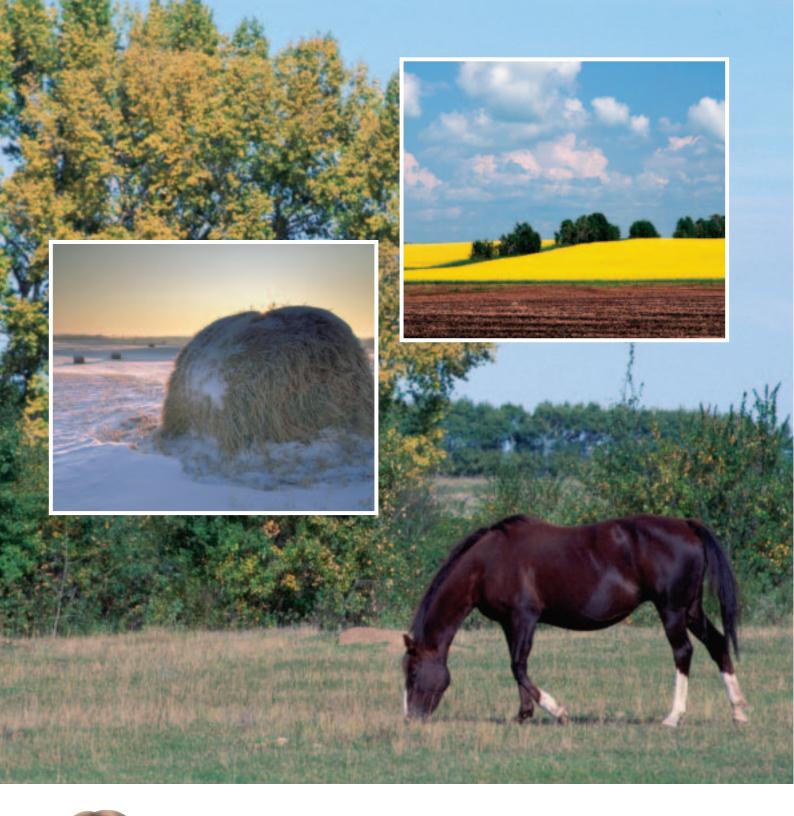
We live in a place where two big rivers meet. We're close enough to the mountains to have lots of rolling hills and forests—and snow, too. In the summer we can go hiking and bike riding along trails. The trails go through our town and into the hills, past the ranches, and through the trees. In the winter, we have lots of fun cross-country skiing on the trails.

Lynnette



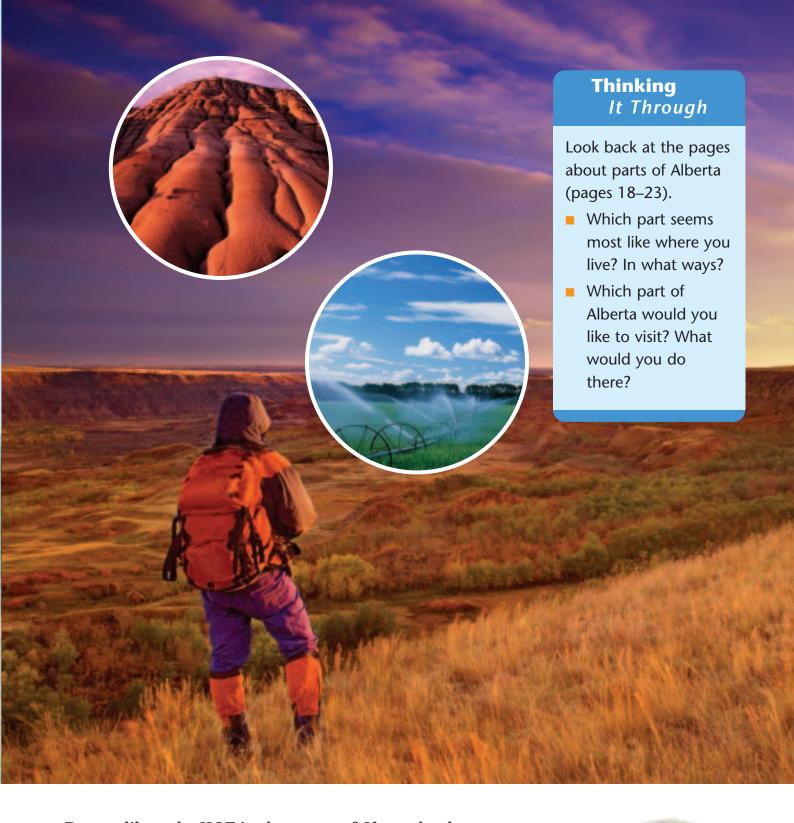
To me, Alberta is jagged, snow-capped mountains. We live right at the foot of one. I love the smell of the pine trees when I hike up mountain paths with my uncle and cousins. Pinecones and wildflowers are everywhere. We usually look for a spot by a clear mountain stream to have a picnic. We often go on drives in the mountains to see snowy peaks and waterfalls.





There's a lot of farmland where I live. I help my dad on the farm, but there's also time for fun. In the spring, I hunt for frog eggs along the ditches. In summer, the timothy grass grows so tall that I can disappear by walking into the field. In fall, I make forts in the broken hay bales. In winter, I ride across the snowdrifts with friends from the other farms.

Natasha



Do you like to be HOT in the summer? If you do, then my part of Alberta is the place for you. The land can be dry here, and we don't have many trees, but there are lots of farms and ranches. The farms grow crops like wheat, barley, and oats. I like the farms that grow my favourites—corn and tomatoes. My mom buys them fresh at the farmers' market. De-li-cious!



What Is the Story of the Land?

words matter!

Geologists study land and rocks, and how they are formed.

Glaciers are very thick sheets of ice and snow that move slowly across the land.

Landscape is the natural scenery of a very large area.

Landforms are the different features of the land, such as mountains, hills, or plains.

The land of Alberta has quite a story! **Geologists** tell us that changes in the land have been going on for millions of years.

First, what is now Alberta was covered with rock. Then, huge oceans formed and covered the rock with water. Later, the rock pushed upwards and became the Rocky Mountains. Then, the oceans drained away, leaving the mountains towering above the land. Geologists also tell us there were earthquakes and volcanoes, and that for thousands of years **glaciers** covered the land.

All of this has given Alberta unique **landscapes** and **landforms**.



Today, the Rocky Mountains are part of Alberta's unique landscape. At one time, there were no mountains here.



These events helped shape and change Alberta. That'll help me answer one of our inquiry questions for the year.

How Is Big Rock Part of the Story?

As the glaciers melted, they created unique landforms. One of these is Big Rock.

Huge rocks fell onto a glacier from a mountain near Jasper. The ice slowly moved, carrying the rocks out of the mountains. When the ice melted, the rocks were left along the foothills. The largest one is Big Rock.

What Are Some Big Rock Stories?

Okotoks is famous because of Big Rock. For thousands of years, the First Nations used Big Rock as a landmark to guide them when they travelled. People today still look for it as a sign that they are nearing Okotoks.

ALBERTA VOICES

Big Rock: A Blackfoot Story

This story is about Big Rock, but it also tells of important values. What can you learn about generosity and honesty from this story?

Napi was out with Fox on a very hot day. When they came to a large rock, Napi took off his robe and threw it over the rock, saying, "Here, I make you a present of this robe." Napi went on, but saw a rain cloud coming up. He sent Fox back to get the robe. "No," said the Rock. "He gave it to me as a present. If you give anything to a Rock, you cannot take it back."

Fox returned to Napi and told him what the Rock had said. Napi was angry. So he ran up to the Rock and took the robe. Then Napi started on, but suddenly heard a great noise behind him. When Napi looked back, he saw the Rock coming. It was rolling along.

So Napi and Fox ran, but all the time the Rock was getting closer. Finally, Napi called for help from some Meadow Larks. The Meadow Larks stopped the Rock and broke it into pieces that we still see today.

Niitsitapiisinni: Our Way of Life (Glenbow Museum Exhibit)



A Part of Life

When we get visitors, we always take them out to Big Rock. We stand in the middle of our flat prairie grass and look up at this huge rock. As we drive out of town, we pass the Big Rock Inn, Big Rock Towing, and Big Rock School. People who live in Okotoks use the name "Big Rock" every day. It's part of our way of life.

Pat Shultz Okotoks resident



The name "Okotoks" comes from the Siksika or Blackfoot word for "rock."



Life by the River

I love living near the river. My dad takes me fishing. We catch northern pike and walleye. If we're lucky, we get a trout or goldeye. We also skip stones across the water. We look for the flattest, smoothest stones, and flick them across the surface to see how many times they skip. I once had a stone skip eight times before it sank! When I'm older, we're going to go whitewater rafting on the river. Lots of people come to raft around here. I can't wait!

Laura Hohn Red Deer

The Athabasca River is the longest river that begins and ends in Alberta. It winds from the Columbia Icefield in the Rocky Mountains to Lake Athabasca, in northeastern Alberta.

How Did Glaciers Create Lakes and Rivers?

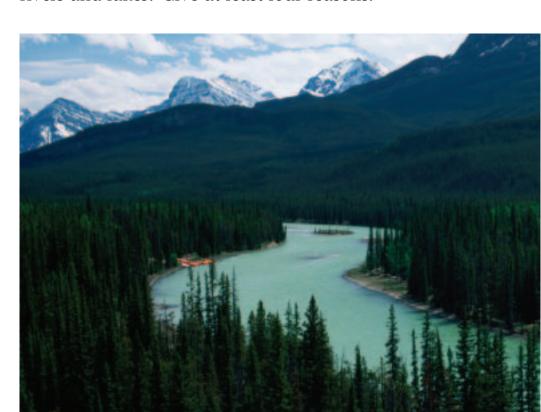
Is your community beside a river or a lake? If so, then it's likely you can see evidence of Alberta's icy past. When the glaciers melted, they made Alberta a place with many rivers.

Glaciers still provide some of the water for Alberta's rivers. Some rivers, like the North Saskatchewan River and the Athabasca River, begin in the glaciers of the Columbia Icefield, near Jasper.

River Communities

Throughout the story of Alberta, rivers have been important to people. The First Nations people fished the rivers and also used them for travel. Paddling in their canoes, they could cover great distances. When the first Europeans came, they also used the rivers as highways. They built forts beside the rivers. Their forts were their homes, their stores, and their warehouses. Later, many more settlements grew by rivers.

Why do you think people choose to settle near rivers and lakes? Give at least four reasons.



Major Lakes and Rivers



Thinking *It Through*

What part do you think rivers and lakes play in the location of cities and towns?

THEN AND NOW

In Edmonton in 1909, Fred Marshall got a rowboat to take people across the North Saskatchewan River. He charged 5 cents a trip! Now, there are bridges that cross the river. Many people can cross the river at one time.



How Were Other Features Shaped?

As the glaciers melted, other features were formed. Read about some of them below.



As the glaciers melted, lakes formed in many places. Today, we still have some mountain lakes that are fed by melting water from glaciers. They are called glacial lakes. They are often a beautiful light blue colour, as you can see in the photograph of Bow Lake shown here.



The Canadian Shield is in the northeast corner of Alberta. Here, rocks from many millions of years ago still cover much of the land. Long ago, the rocks were ground down by glaciers. Now, they are shaped by wind and water.



Hoodoos are also shaped by wind and water. The soft stones of the bottom layers have been worn away, but not the hard top ones. This gives the hoodoos their unique shape. Hoodoos are found in several places in Alberta, including the badlands near Drumheller, and in the mountains near Banff.

Skill Smart

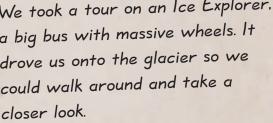
Look on the Internet or in books to find out more about the Canadian Shield in Alberta. Keep track of where you get your information.

ALBERTA ADVENTURE

My Visit to a Glacier

You've seen how glaciers shaped Alberta's land, but would you like a unique glacier experience? That's what I had when my family visited the Columbia Icefield. It's a huge field of ice and snow not far from Jasper. Eight glaciers slope down from the icefield like gigantic tongues. You can get right onto one of them—the Athabasca Glacier.

We took a tour on an Ice Explorer, a big bus with massive wheels. It drove us onto the glacier so we could walk around and take a









The surface of the glacier is amazing. It's covered with tiny cracks and streamlets running with pure icy water. There are also deep crevasses in the ice, so you have to be careful. If you don't watch out, you could fall in!

What Are Alberta's Natural Regions?

words matter!

A **natural region** is an area with its own natural vegetation, climate, and landforms.

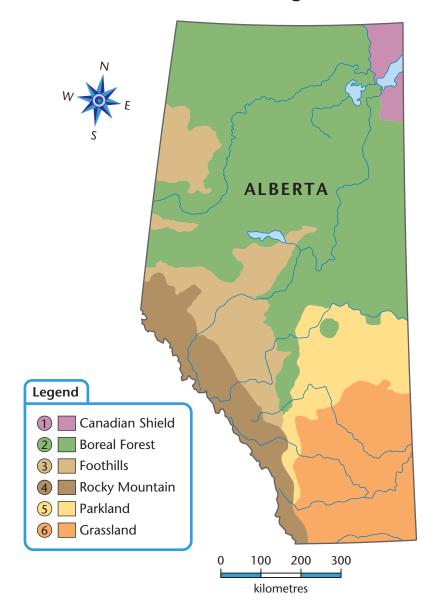
Earlier in this chapter, you learned that Alberta has a varied landscape. There are several areas of the province, each one different from the other. We call these areas **natural regions**. Alberta has six natural regions, as shown in the map below. The combination of all the regions gives Alberta its unique character.

Alberta's Natural Regions

Skill Smart

Look at the map.

- Which natural region covers the biggest area?
- Look back to the parts of Alberta you explored on pages 18–23. Match them to the regions shown on these two pages.





1) Canadian Shield

This rocky region in the north has many lakes and marshes. There is little soil in this region, and only certain types of plants can grow here. Some of these plants only grow in this part of Alberta.



2) Boreal Forest

This region takes up most of the northern part of Alberta. It is almost entirely covered with trees. These trees are used in the forest industries. The region has rolling hills and plains. There are also many rivers and wetlands.



3) Foothills

This region is made up of hills that lead to the Rocky Mountains. In the far south, grasslands cover the foothills. This is a ranching area. As you go farther north, the area is covered with trees.



4) Rocky Mountain

The Rocky Mountain region is the highest area in Alberta. There are deep valleys and rugged peaks. There are still some glaciers here. Trees grow in some areas. Other small plants grow in the rocky soil.



5) Parkland

The Parkland was once an area of grass and trees. Much of this vegetation was cleared so farms could be developed. This area has rich soil and gently rolling hills. This region is sometimes called the parkland prairie.



6) Grassland

It can be very dry in this southern region. Rivers cut deeply into the land. The grasslands are used for farming but also have large areas of grass, with some trees growing near rivers. This region is sometimes called the grassland prairie.



My group has to gather information about the Boreal Forest region. I'll start by gathering some photos off the Internet and this CD-ROM. I can learn a lot from photos.

What Makes a Natural Region?

To understand why parts of Alberta are in a particular region, we need to think about three things:

- natural vegetation—the plants that grow there naturally
- climate—how hot or cold it gets, and how much it rains or snows
- **landforms**—the features of the land, such as mountains, hills, and plains

Alberta's Natural Regions

Skill **Smart**

Look at the map.

- Which natural region of Alberta is your community in? (You may need to check an atlas or a road map.)
- Which region has the fewest large communities? Why do you think this is so?
- Use cardinal and intermediate directions to describe the location of each natural region in Alberta.



Do Regions Change Over Time?

The regions give Alberta its character, but what happens when a region changes?

You are visiting the prairie grasslands 200 years ago. Herds of bison, deer, and pronghorn antelope graze freely. Hundreds of birds live on lakes and waterways, and burrowing owls nest in the ground. You might even see a wolf or a prairie grizzly bear!

The land is covered in native grasses—plants that grow here naturally. There is june grass, spear grass, and western porcupine grass. In the spring and summer, hundreds of flowers bloom. There might be some Siksika [sik-sik-AH] or Piikani [pee-KAH-nee] people camped near a lake with their horses, but there would not be a lot of people. •

What Are the Changes?

Today, many people live in the Grassland region. There are roads, railways, cities, towns, and farm buildings. There are crops growing in fields, instead of the native plants. There are fenced-in pastures where cattle graze. Here and there, you will see oil pumps in the fields. Many of the birds are gone. So are the grizzly bears and most of the wolves.

Thinking It Through

- How can you find out more about the native plants and animals of your region?
- Why do you think some plants and animals are disappearing?
- Some people try, as good citizens, to protect plants and animals that are native to an area. Do you think it is important to do this? Why or why not?



I wonder how changes like this affect quality of life. That's something I need to really think about.





The pronghorn antelope and songbirds like the western meadowlark are still found on the grassland prairie, but there are not as many as there once were.

Viewpoints

Should City Grasslands Be Protected?



Rough fescue grass is the provincial grass of Alberta.

Nose Hill Park is a large park in Calgary. Many people use the park for recreation. It has over 300 km of trails that are used by cyclists and walkers. Yet the park has other purposes as well.

Protecting the Past

Nose Hill Park is home to about 200 wildlife species—animals and plants.

One of the plants that grows here is rough fescue grass. Rough fescue grassland used to cover the Prairies. Today, it exists only in small areas. Nose Hill Park is one of these areas. In addition, many teepee rings have been found in the park. These are stone circles left by people who lived here thousands of years ago. Some parts of the park are also sacred areas for the Pijkani First Nation.



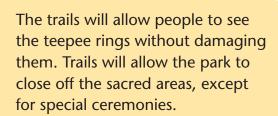
The Trail Question

To protect sacred areas and the grasslands, the city of Calgary made a plan to keep people out of more than half of the park. The number of trails would be cut back. Some trails would be paved, instead of being covered with gravel. Many people agreed with the plan, but some did not. Look at some of the arguments on the next page.

Paved paths will be better for people in wheelchairs and people with strollers.



The trails that are left will be crowded. And cyclists will go too fast on paved paths.





Nose Hill Park is one of the largest city parks in Canada.



Fewer trails will protect a greater area of the park, especially the grassland.



I'm a mountain biker. I wouldn't use paved paths. I like to ride through natural areas.

Over to YOU!

- 1. Form a small group. Take different points of view, as shown above, and discuss what should be done with the trails in Nose Hill Park.
- 2. Is there a park in your community? What does the park give to the community? What does the park give to you? As a good citizen, what can you do to protect the park?



Exploring Points of View

Should people try to save plants and animals that are native to an area? When you consider a question like this, it's important to understand the points of view that different people might have. It helps to sort out opinions on a chart like this one.

What is the question or issue?	
Who are the people giving their opinions?	•
What are the different opinions?	•
Which opinions do you agree with, and why?	
Which opinions do you disagree with, and why?	
What is your opinion? Why?	

Practise the Skill

Copy this organizer onto paper, or use a computer to make a copy. Then use it to explore the viewpoints on the previous two pages. How does the chart help you explore the viewpoints?

How Does Climate Affect Quality of Life?

Have you ever noticed how often people talk about the weather? That's because the **weather** and **climate** help to shape the way we live. Some communities are even named after them—like Cold Lake, Spring Coulee, Sunnybrook, and Windfall. What do the names say about these places?

Why Does Climate Vary?

Climate includes

- temperature: how hot or cold a place gets
- precipitation: the amount of rain or snow

Factors that affect climate include

- latitude: how far north or south a region is
- elevation: whether the region is in the high mountains or the low plains

Some of Alberta's regions are warmer and drier than others. Some are farther north or higher up, and get more snow. Factors like these affect what grows in the regions and what the land looks like.

words matter!

Weather tells us about conditions such as temperature, rain, and sunshine on a single day. Climate is the kind of weather that is common in an area over a long period of time.



Where can I get this information for my region? My dad suggested that I look in the Farmers' Almanac.

Nature's Weather Report

When we walked with my *Musum* (grandfather) in the forest, he would show us many signs that nature gives us. He showed us how the bees would build a nest late in the summer. If it was low to the ground, the winter would be mild, and the snow would not be high. If the nest was high in the trees, then the winter would be cold and long, with lots of snow. He would often remind us that it could be different somewhere else in the country.

Darrell Willier Sucker Creek First Nation

ALBERTA

Thinking *It Through*

- Why do people check the weather?
- What is the climate like in your community?



This is farmland near High Level. How might colder temperatures affect crops in this area?

Is There a North/South Difference?

The tables below show temperatures for two communities in different parts of Alberta: High Level and Lethbridge. Check the map on page 32 to find the location of these communities. What do you notice?

High Level (northern Alberta)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
°C	-20	-17	- 9	2	10	14	16	14	8	0	-12	-19

Lethbridge (southern Alberta)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
°C	-18	– 4	0	6	11	16	18	17	12	7	0	-6

The farther north you go in Alberta, the cooler it becomes. Also, winter days are much shorter in the north. Summer days are much longer in the north. All the same, the effects of climate in these areas might not be what you expect.

Skill Smart

- Use technology to make a line graph showing the information in the tables above.
- Use the Internet to research the temperatures in your community. Add the information to your graph. How is your community similar or different? Why? Explain.

North and South

We have a short growing season here in High Level, but the summer days are long and warm. Even when I get up early, the sun has been up for hours! The sun shines for nearly 18 hours every day, allowing the crops to grow quickly. Sometimes I think I can see them growing before my eyes!

Paul Champagne

ALBERTA

Lethbridge summers are very hot and dry. Even so, the temperature can fall quickly at night. We can get frost at night, any month of the year. We always have to be ready to cover the vegetables in our gardens to protect them from the frost!

Kim Webber

What Happens As You Climb?

You don't need to go north in Alberta to find cooler weather. You can just go up! There are places where the trees stop growing, and grass becomes bare rock. This is because the higher you climb, the cooler it becomes. That's another reason Alberta's climate changes from one region to another.

How Do Winds Make a Difference?

Alberta is famous for its **chinook** winds. In the Siksika language, chinook means "snow eater." In the winter, that is exactly what a chinook does. It is a dry, warm west wind that comes down from the mountains. It has been known to raise temperatures by 25°C within a few hours. The chinook is felt in the southeast more often than in the north. It comes in all seasons. In the summer, it brings very hot, dry weather.

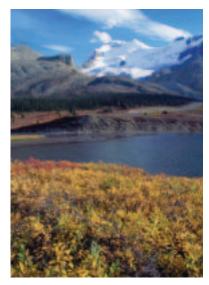
Other winds also affect Alberta's climate. For example, cold winds blowing in from the Arctic can make winter temperatures drop quickly. The foothills and the grasslands often get hot, dry winds.

The Chinook

In 1988, Alberta hosted the Winter Olympics.
I was really looking forward to watching the bobsleigh event at Canada Olympic Park in Calgary. Everyone knows that Alberta has lots of snow and is cold in the winter. Right? Not always! During the Olympics, a chinook wind came down from the mountains. It was warm and dry. Ice melted, so the bobsleigh and luge races were delayed. We all had to wait for the cold winter weather to come back!

Frances Chan

ALBERTA



Plants that grow at the top of the Rocky Mountains are much like those that grow in the far north.

Skill **Smart**

Make a chart, like the one below, showing three factors that cause climate to change in Alberta and the effect of each.

Cause	Effect

Summer is fun in Edmonton!



Very cold temperatures can be hard on livestock in the foothills.



This air ambulance helps people in Fort Chipewyan and other northern communities.

How Does Climate Affect Us?

Think about what you wear, what you do, and how you get from place to place each day. How does that change with each season—or does it? Here are some ways climate affects Albertans.

Activities

Outdoor activities in Alberta change with the season and sometimes with the region. What outdoor activities do you do each season? What activity would you like to do in a different region?

Work

The jobs of many people are affected by climate. Imagine how the seasons bring different challenges to farmers and ranchers. If spring is too cold, crops might not be planted on time. In the summer, very wet conditions can affect the harvest. Hailstorms can cause a lot of damage to crops.

Travel

In summer, the only way to get to northern places like Fort Chipewyan is by air because the ground is soft and wet, and it is hard to build roads. Air ambulances take very sick people to hospitals in Fort McMurray or Edmonton. In winter, people travel on special winter roads and on ice roads. If the weather is unusually warm, the ground thaws. Then people need to rely on airplanes again.

Thinking It Through

Talk with a partner about how climate affects quality of life. Use information on this page and the next to get you started.

Stormy Weather!

Tornado Hits Edmonton



On July 31, 1987, a severe storm struck the Edmonton area. Then, at 3:00 p.m., a black funnel cloud touched the ground. It swept through the east side of the city, roaring like a freight train. It was one of the biggest tornadoes in Canadian history, carving a path of destruction that was 37 km long! Twenty-seven people died, and 600 were injured.

EARLY SNOWSTORM IN CALGARY

On September 16, 2003, people in Calgary woke up to a snowstorm, even though it was still officially summer! West of Calgary, Jasper and Banff got the most snow—up to 25 cm. But there was good news: this summer snowfall helped to cool the Lost Creek fire in Crowsnest Pass.

WILD WEATHER



April 14, 2002, was a wild weather day in Alberta! On the same day, there was snow in Edmonton, while grass fires burned near Calgary. Near Medicine Hat, a 10-vehicle accident was caused when strong winds blew dust clouds across fields and roads.

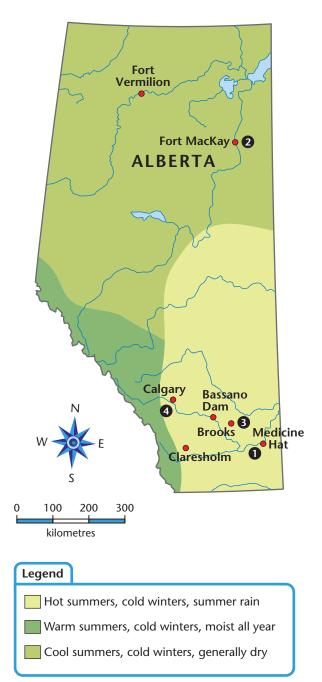


How do the climates match up with the natural regions? I can look back to the map on page 32 to see.

What Is Alberta's Climate?

Look at the climate map below. The legend tells you what the climate is like in different parts of Alberta. The numbers on the map match the numbers on the photographs on the opposite page. Look at the photographs to see the effects of climate and weather in these places.

Alberta's Climate Areas



Skill Smart

- Use the map to locate the places with extreme weather described on the opposite page.
- Make a chart to show what the climate is in each region and explain how climate would affect life there.

What Are Some Weather Extremes?

Alberta's weather has many surprises, like the extremes shown here. How do you think these extremes help give Alberta a character of its own? How do you think these extremes affect quality of life?

- Many parts of Alberta are very cold in winter, but Alberta is the sunniest province in Canada.
- Alberta is famous for its dry, warm chinook wind.
 It raises temperatures very rapidly. The **Alberta clipper** is a fierce, cold wind that starts near the Rocky Mountains. It quickly blows out of the province.
- The coldest day ever recorded in Alberta was in January 1911, in Fort Vermilion. The temperature was –61.1°C. Yet in December 1999, it was over 20°C in Claresholm. It was so warm that grass fires broke out in the area, and trees sprouted leaves.
- It has been known to snow in parts of Alberta even in summer months, but look at the temperature on the warmest day ever recorded in the province. It was 43.3°C at Bassano Dam on July 21, 1931.
- Alberta can get a lot of rain and snow, but parts of the province can get very dry, making forest fires a hazard.
- The foothills and eastern slopes of the Rockies are areas in Canada most likely to be hit by lightning. They get about half a million strikes each year!



Set Your Skills in Motion

Explore Points of View

- Whitecourt is known as the "snowmobile capital of Alberta." Its rolling hills, forests, and snow make it a great place for snowmobiling in the winter. How do you think people in Whitecourt feel about this? With a partner discuss what the points of view might be.
- Each of you should take on the role of a person with a different viewpoint. Express your thoughts. Use the organizer from the Skill Power on page 36 to record your views.



Big Rock travelled, roughly, from Jasper to Okotoks. Use the scale on a map of Alberta to measure the distance Big Rock travelled.

Create a News Article

- Ask people in your community, check at the library, or search the Internet to find out about a severe storm or unusual weather event in your area. Look for stories about how people helped one another during this weather disaster.
- Create a newspaper or e-news article about the weather event.
 Include photos or diagrams.

Compare Regions

Compare the region in which you live with another region in Alberta. Record your comparisons in a Venn diagram or use a chart with the following headings: Natural Vegetation, Landforms, Climate. Gather your information from this chapter or other sources. List your sources below your diagram or chart.

Write a paragraph telling more about the unique features in your region that make it different from the other region.

? Inquiring Minds

Look What You Have Learned!

In this chapter, you explored how Alberta's land has been shaped and changed over time. You've learned how these changes have created the landscape and landforms of today. You've found out about the regions of Alberta—where they are and how they are different from one another. You've looked into climate and weather and how they affect people's lives.

Review the inquiry questions for this chapter:

- How have the unique land features of Alberta been shaped over time?
- What is it like living in each of the regions of Alberta?

Pick a region other than your own. Gather information to inform people about it. Use this book and other sources. Be sure to keep a list of your sources.

- Make jot notes about important aspects of the landscape, interesting landforms, the weather and climate, the region, and things people can do outside.
- At the end, list important points about what it would be like to live there.

Present your information as a page for a magazine or Web site. Include a title, headings, and photos with captions. Finish with a summary of what it would be like to live there.

Take Time to Reflect

- What steps did you take to help you read this chapter?
- What did you learn that will help in the next chapter?



Choose something from this chapter to save for your Alberta Treasure Chest.