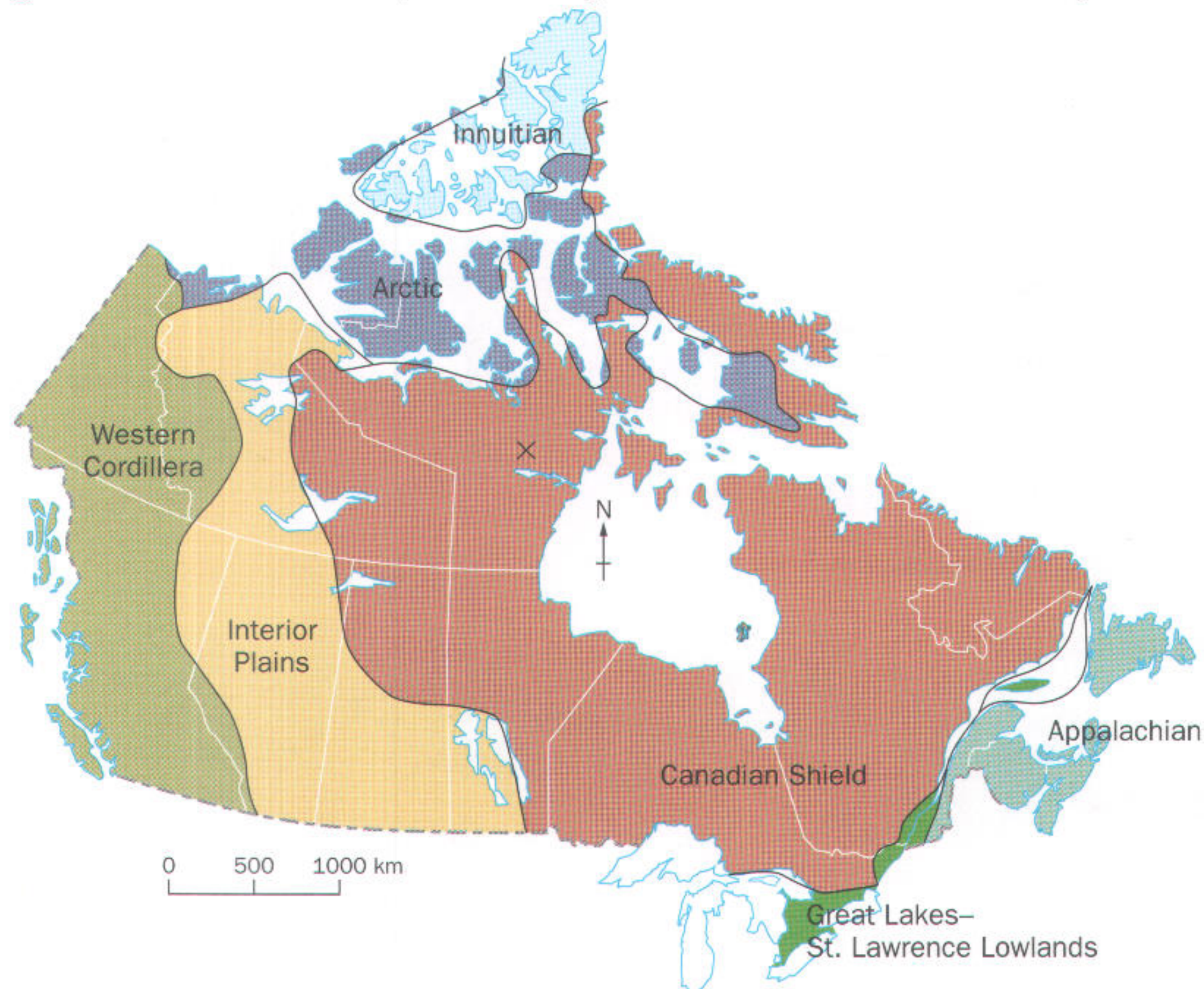


## OUR DIVERSE REGIONS

## Cross-Canada Slogan Match

You have been put in charge of promoting Canada's seven landform regions. A promotions firm has come up with a list of catchy slogans, but they haven't told you what regions they apply to. See if you can match each of the following slogans to one of the regions shown on the map in Figure 2.1. (Some regions have more than one slogan.) Write your answers in your notebook. If you don't get them all the first time, don't worry; all the answers are in this chapter.



◀ **Figure 2.1:**  
The seven  
landform regions  
of Canada

1. Reach new heights in Canada's highest mountains
2. Find peace in our many natural harbours
3. Everything is in "plain" view out here
4. You'll love our lakes!
5. Mountains, islands, and ice
6. We've got the brightest lights and the biggest cities!
7. Discover the Northwest Passage
8. Come watch the wheat grow
9. Stand tall among the towering coastal trees
10. Our mines are yours to discover!

**GeoTrivia #1**

In Figure 2.1, the small "X" near Baker Lake marks the geographical centre of the country. It's surprisingly far north!



## Words to Know

region  
 landform region  
 clay belt  
 escarpment  
 topographic map  
 contour line  
 military grid  
 ratio scale  
 contour interval  
 plateau  
 satellite image  
 outcrop

## In this chapter, you will

- find out what a region is
- see how Canada's seven landform regions were formed
- examine how people live in these regions and use regional resources
- learn about the landforms and people of Nunavut
- read a topographic map

## What Is a Landform Region?

If you have a lot to learn, dividing it up into smaller parts makes the job easier. When geographers divide the Earth into regions, they can understand it better. A **region** is an area with certain characteristics that set it apart from other areas.

The two regions shown in Figure 2.2 have completely different landforms and natural vegetation. The mountain region seems to offer more possibilities for human activity, with forests and rivers for industry and recreation. The desert seems to be a harsh and barren region, but don't count it out. There could be oil under the surface, just like in the Middle East. A **landform region** is a part of the Earth with a unique set of physical features that people often use to meet their needs. In this chapter, you will look at seven different landform regions, each with a different set of natural and human characteristics.



▲ Figure 2.2: Two very different landform regions

## Canada's Landform Regions

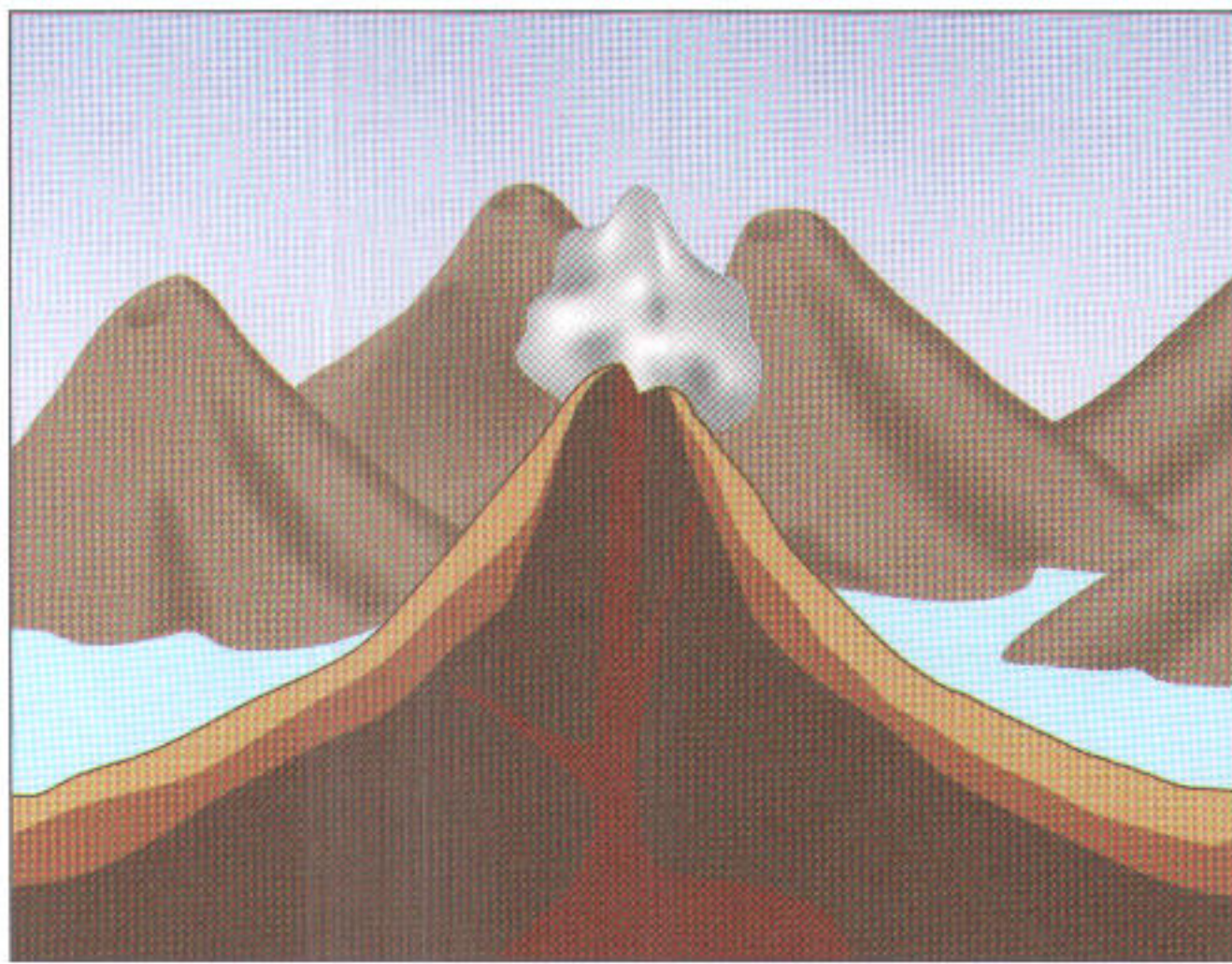
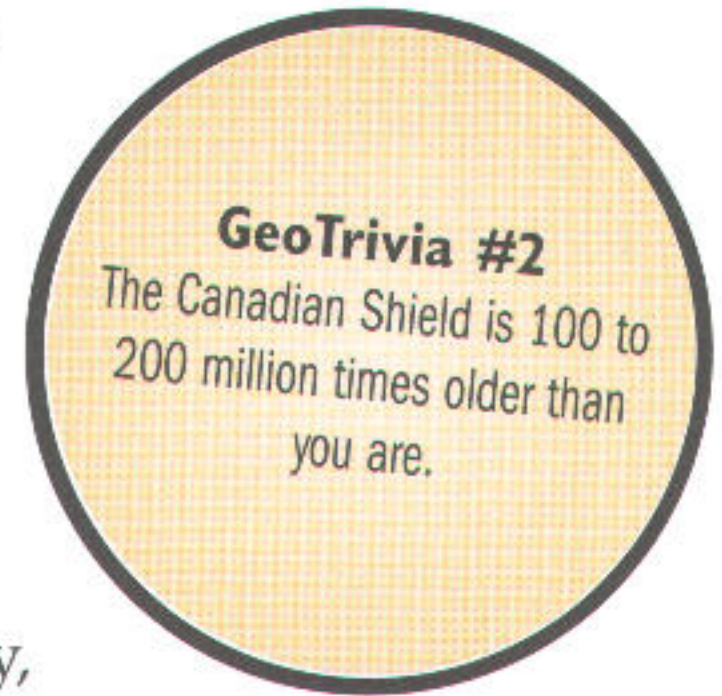
Look at a tree stump and you'll see how the tree grew outward from the centre. Canada grew the same way. The oldest part of the country, the Canadian Shield, is in the centre, surrounded by younger landform regions. As the ancient rocks of the Shield eroded, they were deposited in the surrounding oceans as sediment. Later, the ocean floors folded up into great mountain ranges, forming new regions. We'll look at Canada's landform regions from the centre outward, starting with the Canadian Shield.



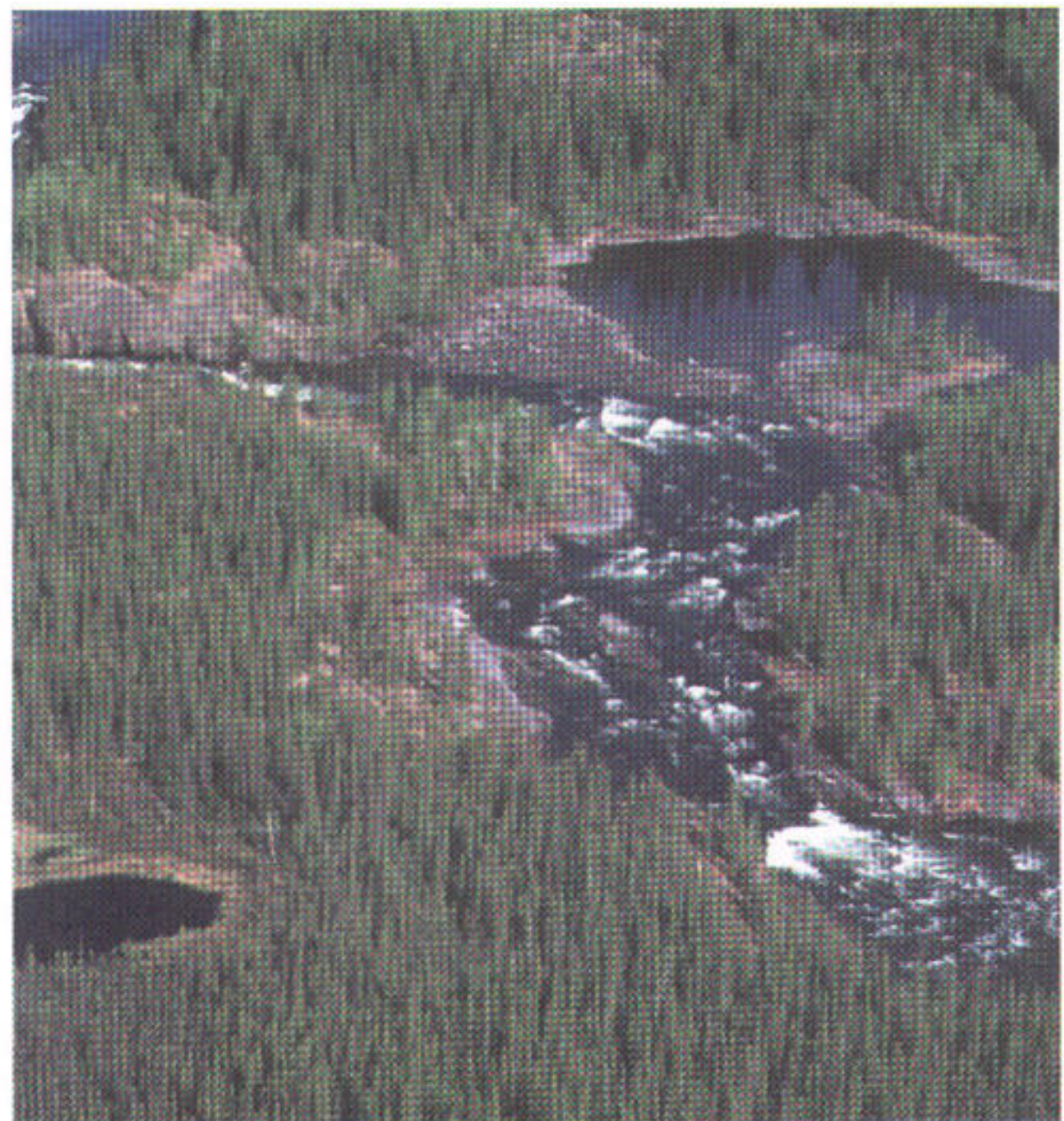
1. Explain how Canada's basic structure can be compared to a tree. How is it different?
2. Describe the features of the Earth's surface in your area. How have people made use of them?
3. Make a map to name the seven major landform regions of Canada. Locate and name your community on the map.

## The Canadian Shield

This region covers almost half of Canada. Figure 2.1 on page 37 shows that it is shaped like a doughnut, with Hudson Bay as the hole. The Canadian Shield formed in stages starting about three billion years ago. Massive volcanic eruptions raised mountains from the sea to form the core of a new continent. Rich veins of metallic minerals, such as gold, silver, and nickel, squeezed into these igneous rocks (rocks created from molten magma). Then, billions of years of erosion levelled the mountains, putting the minerals within reach of miners. During the ice ages, moving glaciers scraped much of the soil from the Shield. As they moved, the glaciers marked the land with hollows and depressions. Today, this region is covered by thousands of lakes and swamps left in these hollows.



▲ **Figure 2.3:** Formation of the Canadian Shield



▲ **Figure 2.4:** The Canadian Shield

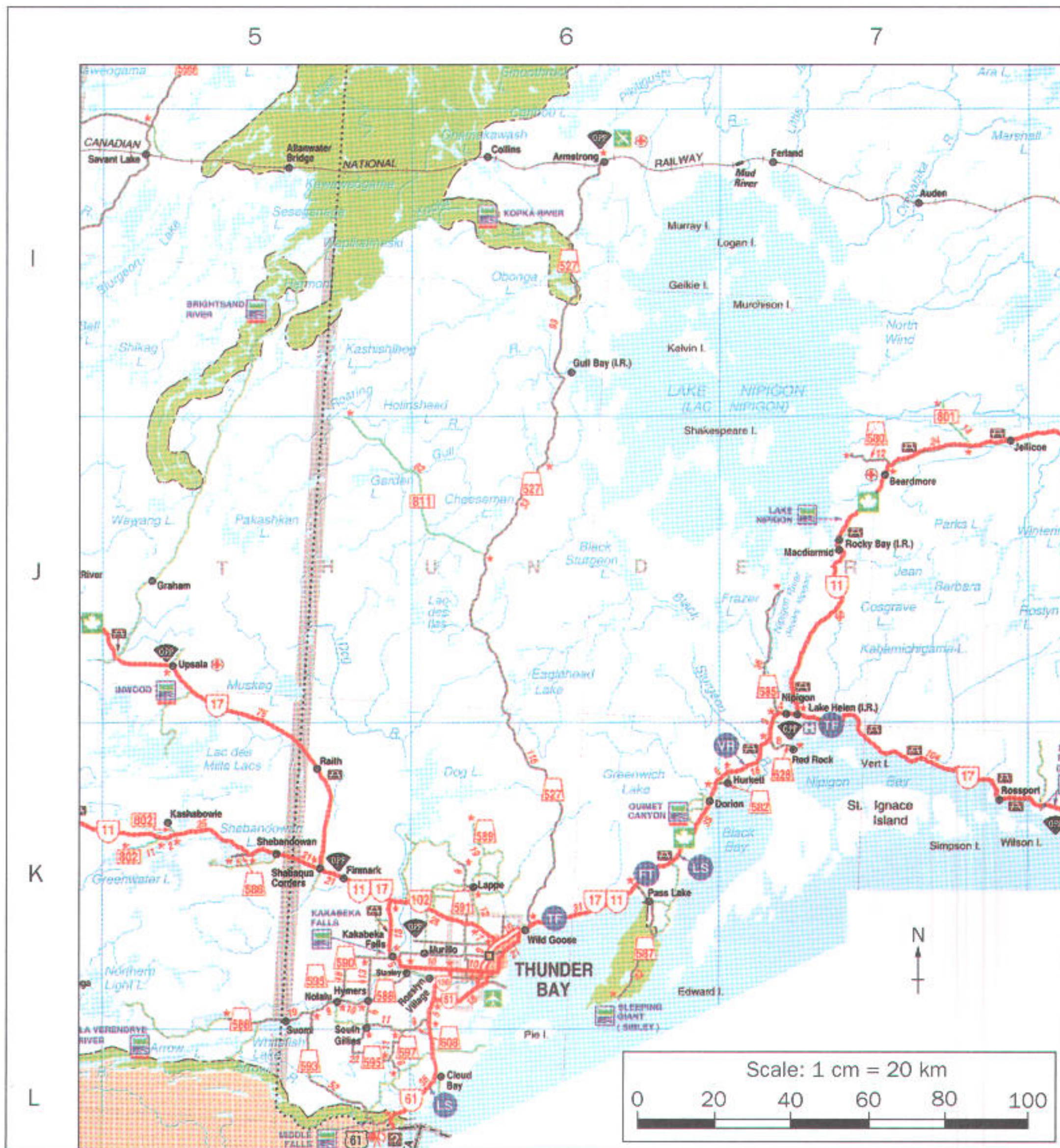
4. Why does the Shield have igneous rock? Why does the region have rich deposits of metallic minerals?
5. Look at the photograph in Figure 2.4. List three different Shield characteristics shown in the picture. Suggest recreational uses for the area.



## The Human Geography of the Shield

Mining, hydroelectric power, and forestry are all important resources in this landform region. The southern Canadian Shield has pockets of farmland, called **clay belts**. These areas were once the bottoms of glacial lakes.

The population of the Canadian Shield is widely scattered, but most people live in the southern parts. Only a few cities have 100 000 people—Sudbury and Thunder Bay in Ontario, and Chicoutimi–Jonquiere (now called Saguenay) in Quebec. In the summertime, lakes, forests, and parkland attract boaters, cottagers, and campers. But for most of the year, the Canadian Shield is a region with many natural resources and few people.



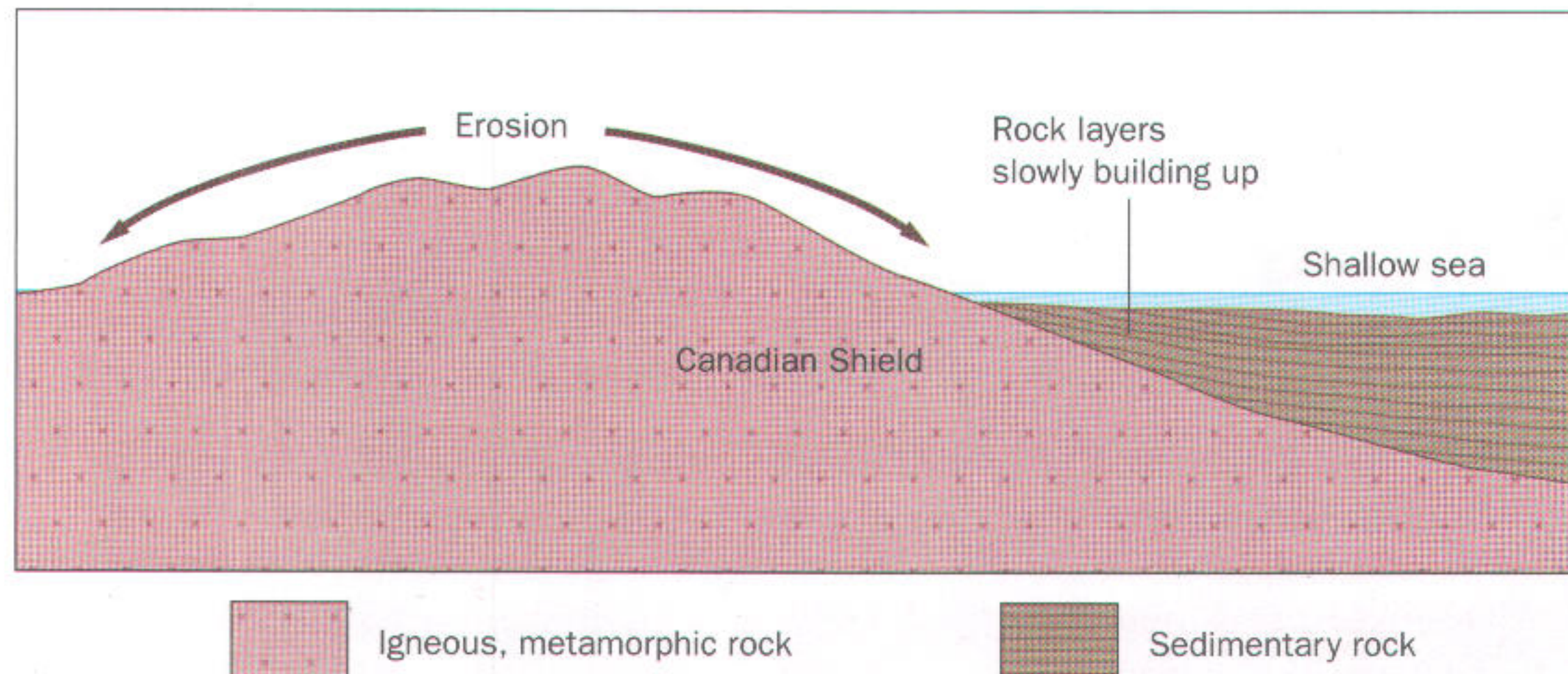
▲ Figure 2.5: Northern Ontario: the Canadian Shield

6. Use the map in Figure 2.5 to describe the following Shield characteristics. Give specific examples.
- |                                |                                     |
|--------------------------------|-------------------------------------|
| a) amount of lakes and rivers  | c) important provincial parks       |
| b) amount and pattern of roads | d) amount and pattern of population |



## The Great Lakes–St. Lawrence Lowlands

This is a low-lying area located (as you probably guessed) around the Great Lakes and along the St. Lawrence River. Half of this small landform region is in Ontario, and the other half is in Quebec. It is a region of sedimentary rock—material deposited in ancient seas as the Canadian Shield eroded. Eventually, parts of the seas filled up with sedimentary rock, creating new land areas. Much of this rock is about half a billion years old. It comes from a time when living things had not yet emerged on land.



▲ **Figure 2.6:** The formation of the Great Lakes–St. Lawrence Lowlands

7. Where did the material come from to form the Lowlands? Why are the Lowlands made up of sedimentary rock rather than igneous rock?

During the ice ages, ice sheets moved south into the region, pushing earth and rock along with them. For this reason, much of the region is covered with deep layers of soil. Huge glaciers scraped out basins, which filled with water as the glaciers melted. These basins became the Great Lakes.

8. Give two different ways in which ice affected this region.

### The Niagara Escarpment

You've probably seen pictures of Niagara Falls. Perhaps you've even visited it. What you may not have realized is that all that water is falling down a ridge that runs right across Southern Ontario—all the way from Niagara Falls to Manitoulin Island. It is called the Niagara Escarpment. An **escarpment** is a sharp change in height caused by the rapid erosion of soft sedimentary rock. The Niagara Escarpment has a hard layer of limestone rock formed from the remains of coral reef and other ancient fossils. Softer shales and sandstones above this layer have worn away and left the cliff that Niagara Falls drops over.

The Escarpment provides stone and cement for the building industry, and recreation for people in the region. Many popular ski resorts use the Escarpment, and the Bruce Trail takes hikers along its crest.





◀ **Figure 2.7: Map of the Niagara Escarpment in Southern Ontario**



▲ **Figure 2.8: A view of the Escarpment**

9. Explain how the Niagara Escarpment was formed.
10. Use a road map or an atlas map to locate your own community in relation to the Niagara Escarpment. How close to this feature do you live?

### The Human Geography of the Lowlands

The Great Lakes–St. Lawrence Lowlands region is very heavily populated, especially along the major waterways. Two-thirds of Canada's people live here, particularly clustered in the Greater Toronto Area and Metropolitan Montreal. The region is the manufacturing heart of Canada, particularly for the automobile industry. Prosperous farms are located between the cities, but this fertile farmland is threatened by urban sprawl. Farmers raise livestock and produce a wide range of fruits, vegetables, and grains. This small region faces the pressures of a large and growing population.

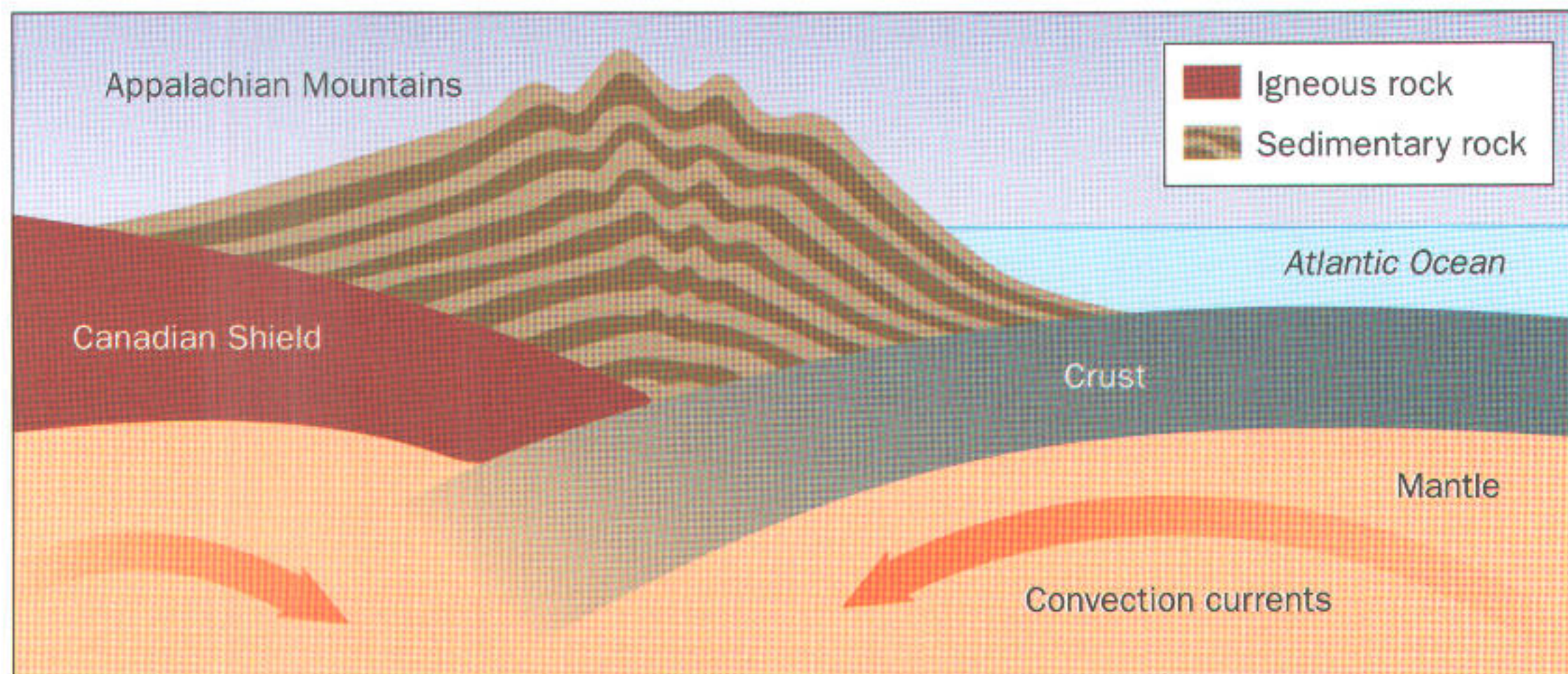
11. Brainstorm a list of five reasons why the Great Lakes–St. Lawrence Lowlands is so heavily populated.
12. Make a simple sketch to show the highway, the plain, and the Niagara Escarpment in Figure 2.8. Suggest why the Escarpment is heavily forested.
13. Make a list of five ways people use the land below the Escarpment in Figure 2.8. Which uses might threaten fruit orchards in the area?



## The Appalachians

The Appalachian region in eastern Canada is a very popular summer tourist destination, with a unique mix of landforms and people. The rugged old mountains found in the region began to form about 250 million years ago. Plate movements forced the sedimentary rock on the ocean floor to fold upwards, and in some places metallic minerals squeezed into cracks in the rock.

Then, erosion forces ground these mountain ranges down to a fraction of their original height, and formed flatter plains areas between them. Rising oceans drowned some lowland areas, creating a jagged coastline with many excellent natural harbours. Part of the Appalachian region extends far inland, forming the southern edge of Quebec.



▲ **Figure 2.9: The formation of the Appalachian Mountains**

14. Make a list of steps to detail how the Appalachians developed.
15. If you were an early explorer, what geographical characteristics would you look for when choosing a place to land? Why are natural harbours common along the Atlantic coast?

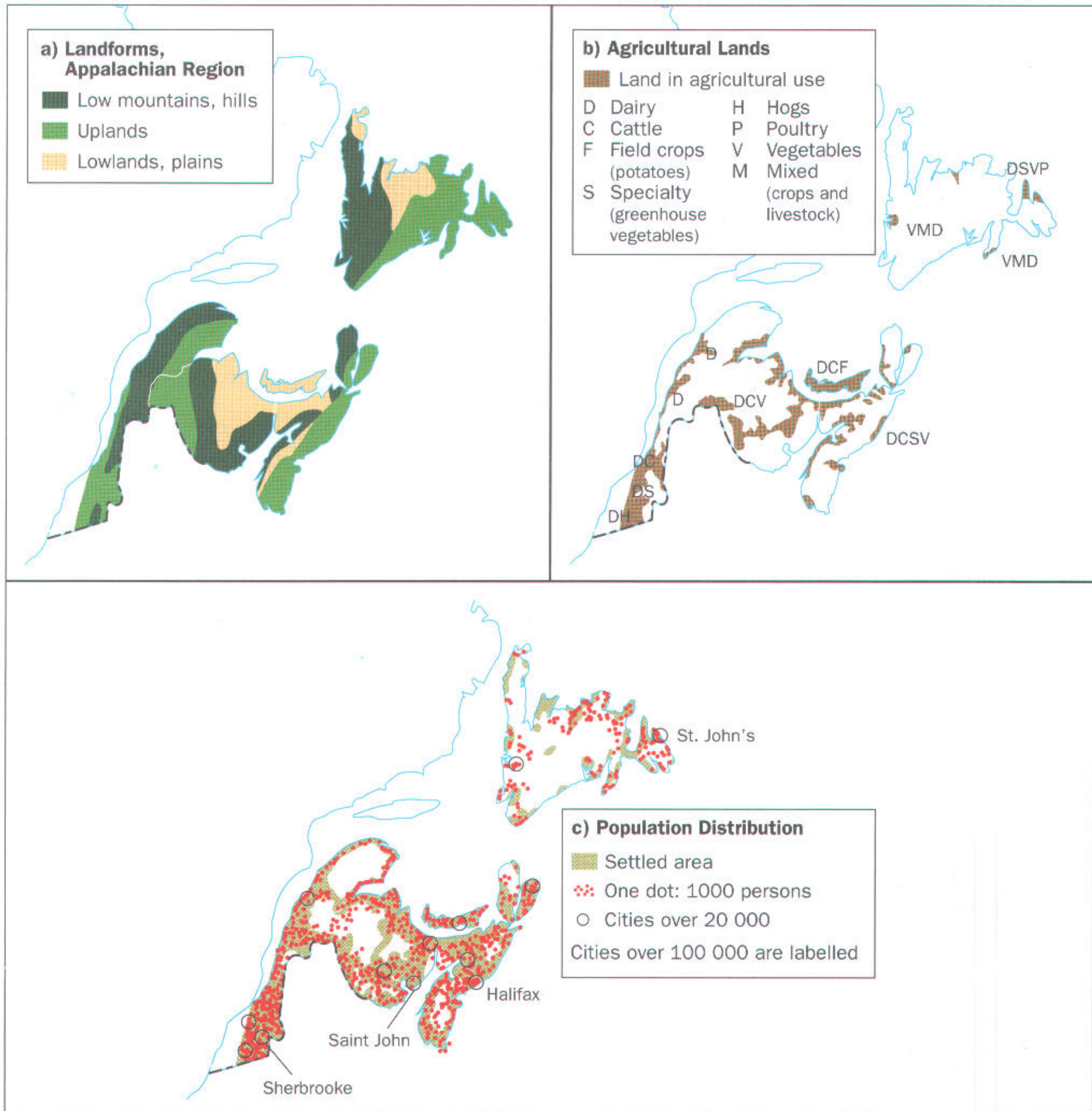
### The Human Geography of the Appalachians

Aboriginal hunters and fishers were the first residents of this region. The Mi'kmaq lived on the mainland, while the Beothuk inhabited Newfoundland. Later, European explorers set up colonies along the region's coastline.

Today, the Appalachian region has about one-tenth of Canada's total population. There are only four cities of 100 000 people: Sherbrooke (Quebec), Halifax (Nova Scotia), Saint John (New Brunswick), and St. John's (Newfoundland and Labrador). Lately, problems in the fishing industry have forced many people in small coastal fishing communities to look for work in the cities.

Next time you grab a bag of potato chips or wolf down some french fries, thank the farmers of the Appalachian region! The fertile soils of Prince Edward Island and New Brunswick are perfect for growing potatoes, which are sold in Canadian and world markets. This is a landform region with many unique characteristics.





▲ **Figure 2.10:** The Appalachian region, showing a) physical features, b) agricultural land, and c) population distribution

- Examine the maps in Figures 2.10a and 2.10b. Which types of landform have most of the Appalachian region's farmland? Which type of agriculture is most common in the region?
- Examine the maps in Figures 2.10a and 2.10c. Is the Appalachian region's population pattern caused by landforms or by the sea? Explain your answer with map evidence.
- Compare the maps in Figures 2.10b and 2.10c. Where do you find populated areas without agriculture in the region? What other jobs would support communities in these areas?

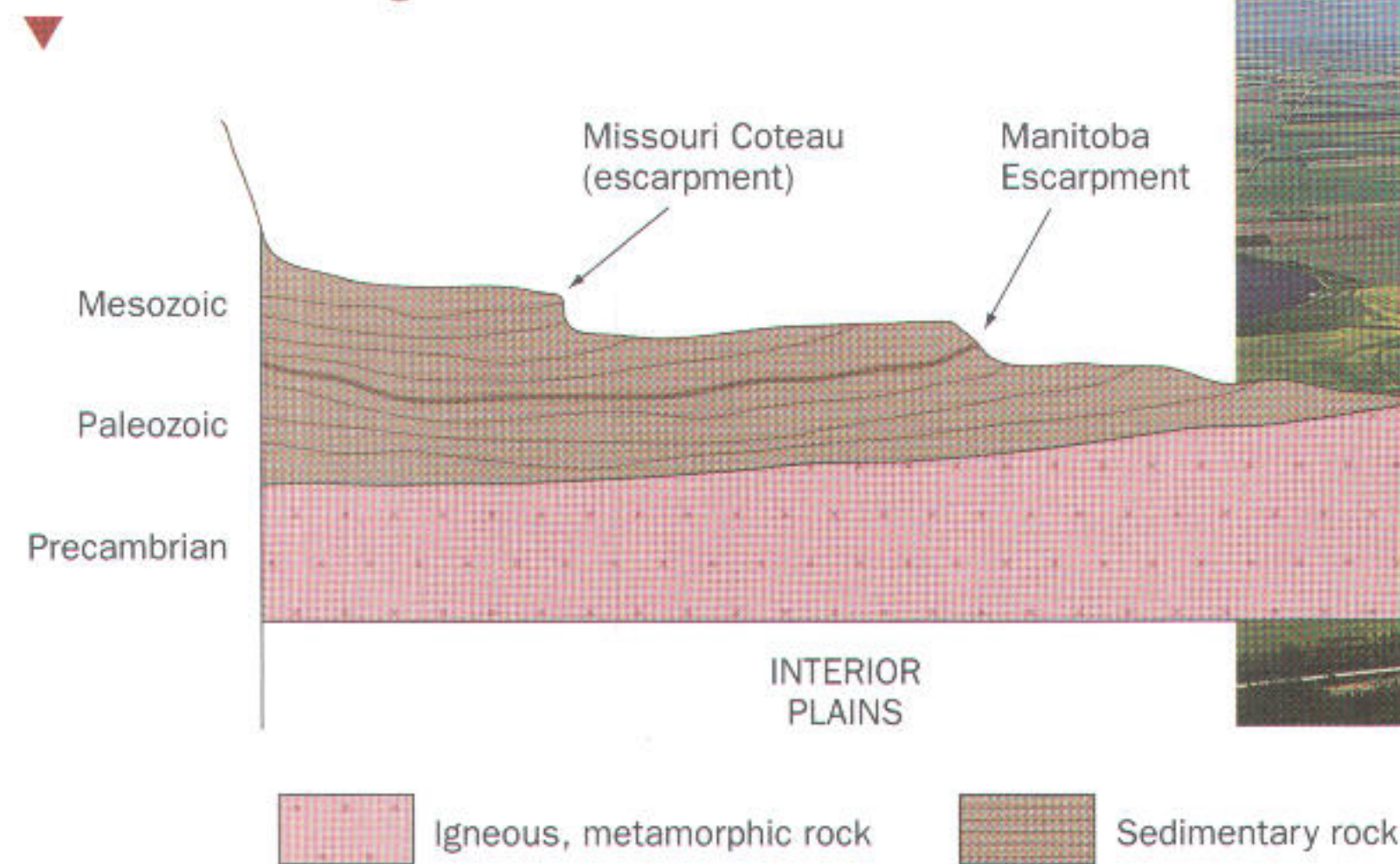


## The Interior Plains

In the nineteenth century, an explorer named William Francis Butler called this western region “The Great Lone Land.” This is the Interior Plains region—a large, wide-open area, without mountains or trees to limit the horizon.

Much of the Interior Plains is 200-million-year-old sedimentary rock. As inland seas filled with sediment, fossilized sea life was chemically changed into oil and natural gas. Gradually, erosion carved the region into the three levels shown in Figure 2.11, divided by escarpments in Manitoba and Saskatchewan. The ice ages came and went, leaving the Interior Plains region covered by thick soil layers suited for agriculture.

**Figure 2.11: Formation of the Interior Plains region**



**▲ Figure 2.12: The Interior Plains**

19. Look at the photograph of the Interior Plains in Figure 2.12. Use it to list five different characteristics of the region.
20. Brainstorm a chart of benefits and problems of this region, from the point of view of the pioneers who settled it.

### The Human Geography of the Plains

Seen from an airplane, the Interior Plains look like a patchwork quilt of squares. That’s because the flat-to-rolling land was easily measured into square parcels by government surveyors. Wheat and other field crops are grown on large farms, while even larger beef cattle ranches are found in dry areas of southern Alberta. Two cities in the region have populations approaching one million. Edmonton is the centre of Canada’s oil industry, and Calgary is the hub of our natural gas development.

21. Use the topographic map in Figure 2.13 on page 46 to record evidence of a) the way surveyors divided up the land in the region, and b) three regional resources.



# GEO SKILLS

## READING TOPOGRAPHIC MAPS

A **topographic map** is a detailed map that shows both physical and human features. This type of map includes map symbols to show human features such as buildings and bridges. **Contour lines**, thin brown lines that trace the surface elevation, show how high the land is above sea level. Topographic maps also use a special distance scale and a grid system for finding exact locations.

### Purpose

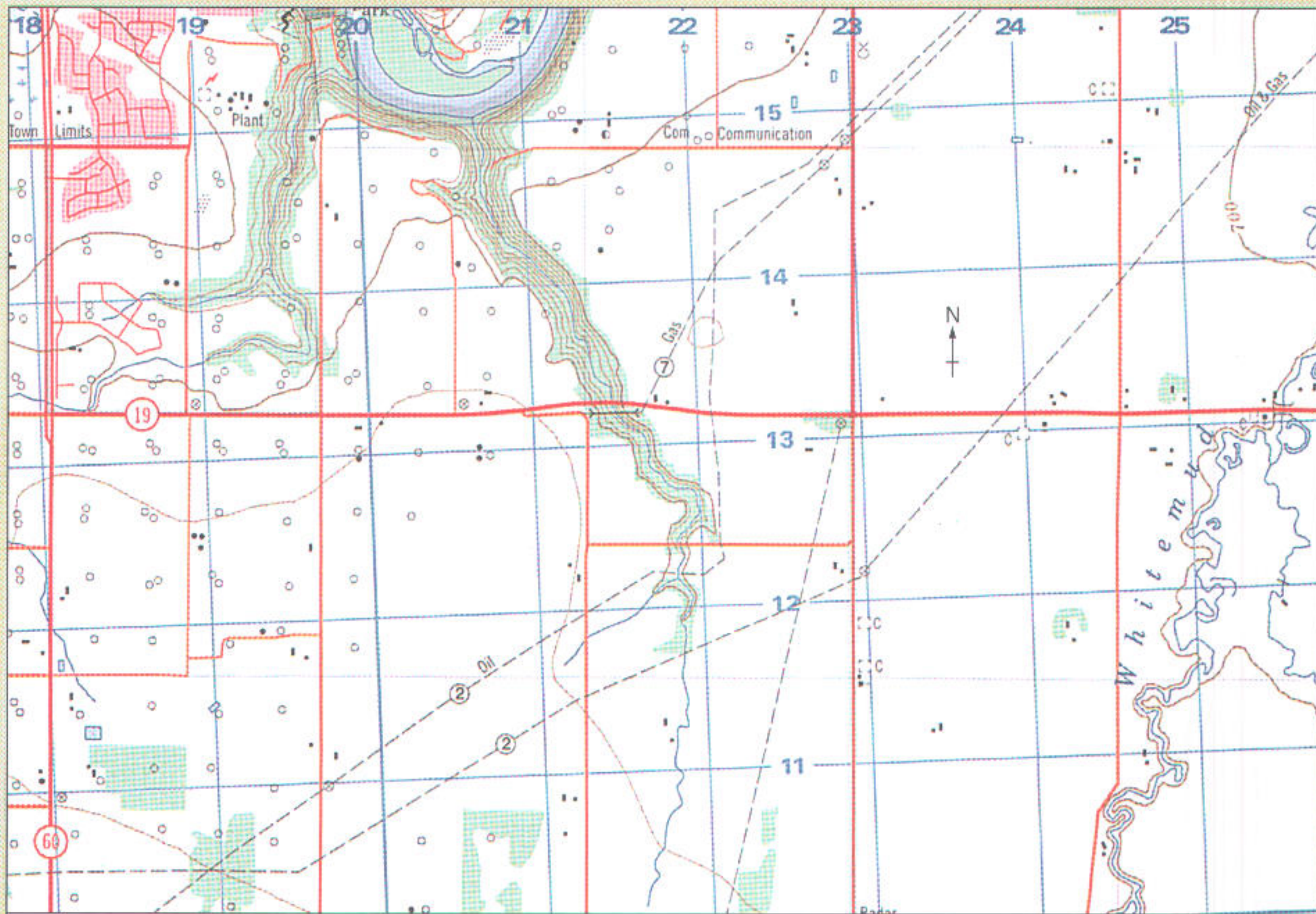
These large-scale maps are used for hiking

and other outdoor recreation, for military planning, and for geographic studies.

Here are some steps to follow to help you read a topographic map.

### Step 1

Get to know the symbols used in the map legend. Topographic maps use many area, line, and point symbols. The map legend in Figure 2.13 shows some of these.



#### Area Symbols

- water
- open space
- wooded area
- built-up area

#### Line Symbols

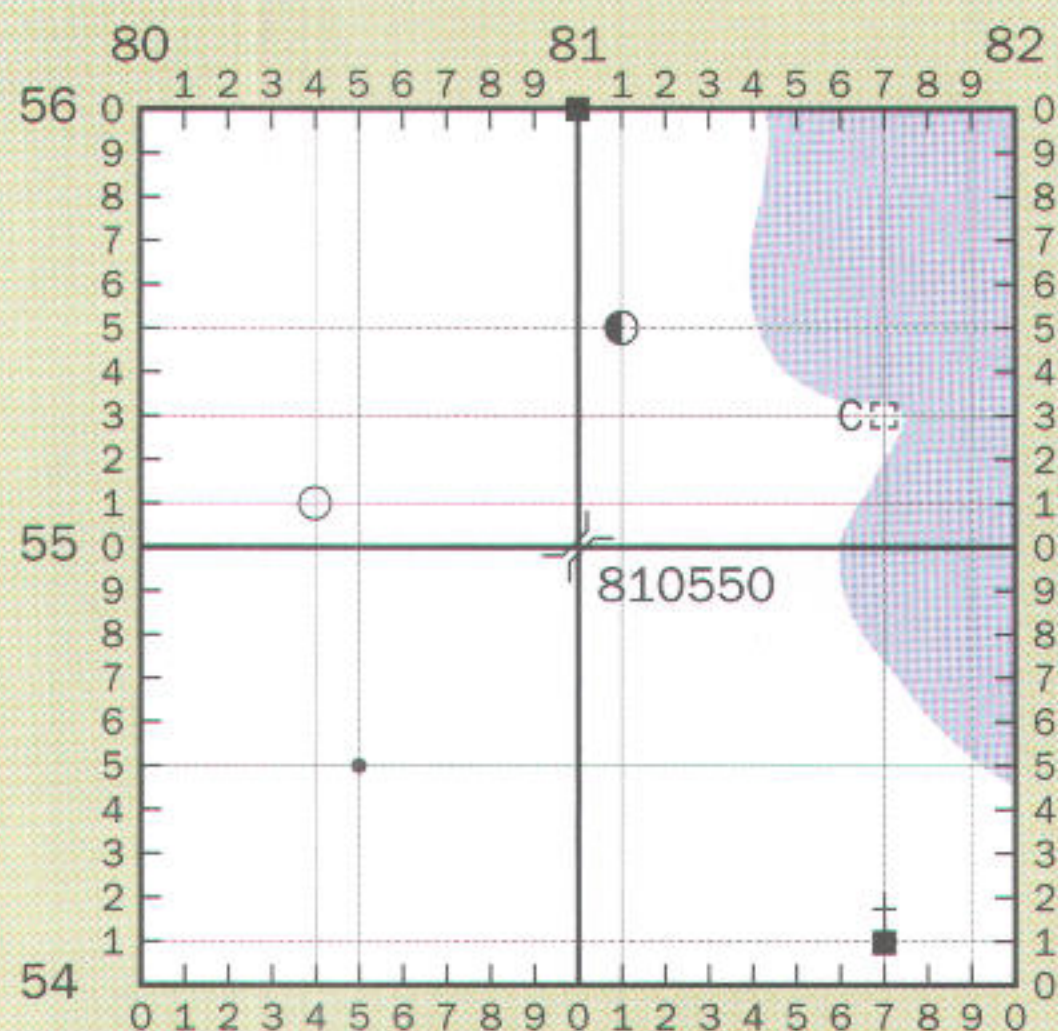
- hard surface road
- loose surface road
- contour line (elevation)
- pipeline underground
- pipeline control valve

#### Point Symbols

- well (oil, gas)
- tanks (oil, gas storage)
- silo
- cemetery
- buildings
- place of worship
- bridge
- footbridge

▲ Figure 2.13: Topographic map of the interior plains of Alberta, 1:50 000 scale





▲ Figure 2.14: Military grid

### Step 2

Use the **military grid** to describe exact locations. Armies use these maps to locate enemy positions, so they need to be accurate! Lines numbered from 00 to 99 cross the map in both directions. Read the north-south lines first. For example, the bridge in Figure 2.14 is on the 81 north-south and 55 east-west lines.

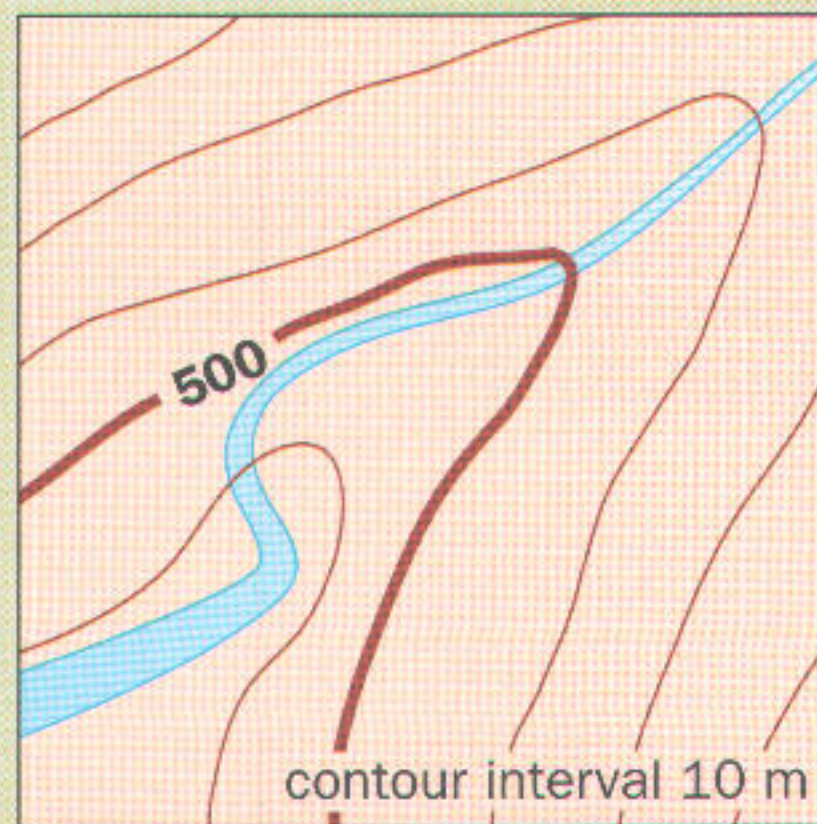
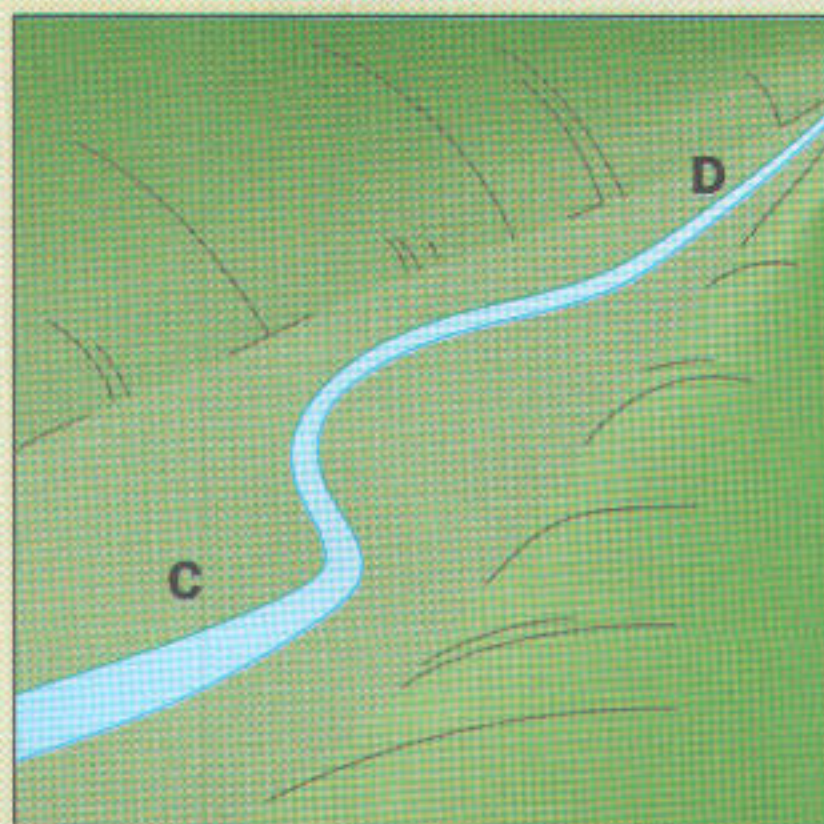
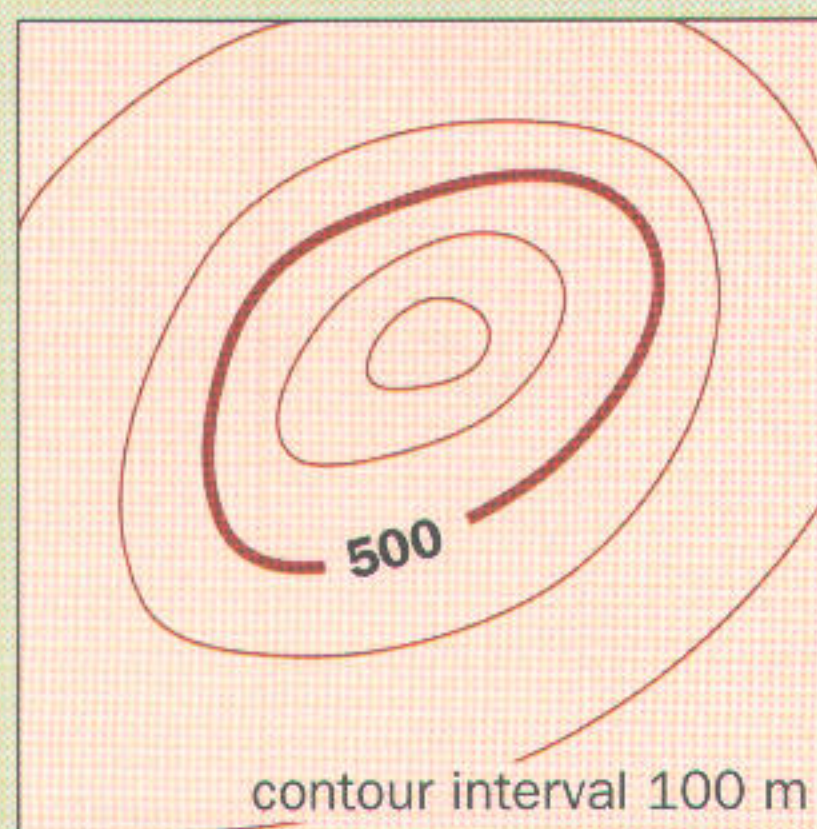
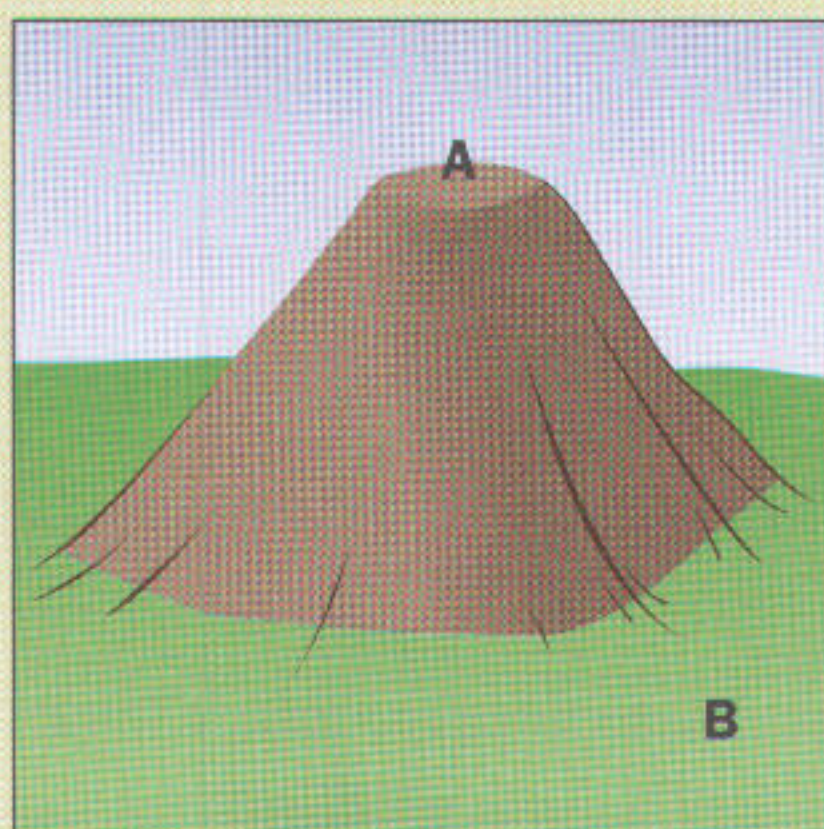
This position can be written 81.0 by 55.0, or 810550.

### Step 3

Read the map scale to find distances. Topographic maps use a ratio scale instead of the line scale on road maps. A **ratio scale** compares map distance to actual distance with a ratio number. If a map has a ratio scale of 1:100 000, then 1 cm on the map represents 100 000 cm (or 1 km) on the Earth. The most commonly used topographic scale is 1:50 000. It means 1 cm = 0.5 km.

### Step 4

Identify physical characteristics of the land by looking at the contour lines. Hills are closed circles, while river valleys have a V-shape pointing upstream to the source of the river. The examples in Figure 2.15 show a hill and a river valley drawn normally and topographically. Can you locate points A, B, C, and D on the topographic diagrams?



▲ Figure 2.15: How hills and river valleys appear on topographic maps



Contour lines close together mean the land is steep, while land with few contours is flat. The height between the lines is the **contour interval**. Find the contour interval by

comparing the numbers on neighbouring contour lines. For example, if you see contours marked 90 and 95, the contour interval is five metres.

### Practise It!

Use the topographic map of the interior plains of Alberta, and its legend, in Figure 2.13 on page 46 to answer these questions.

1. Draw three symbols that prove this is an important oil-producing region.
2. What is found at each of these locations?  
i) 210140    ii) 229115    iii) 186123
3. a) Find the map ratio scale. How much actual distance does one centimetre represent?  
b) How far is it from the plant building at 193153 to the cemetery to the east-southeast (at 240130)?
- c) Which side of the map relies most on the oil industry?
- d) How can you tell that farming occurs across this whole map?
4. Is the area flat or rugged? Explain.

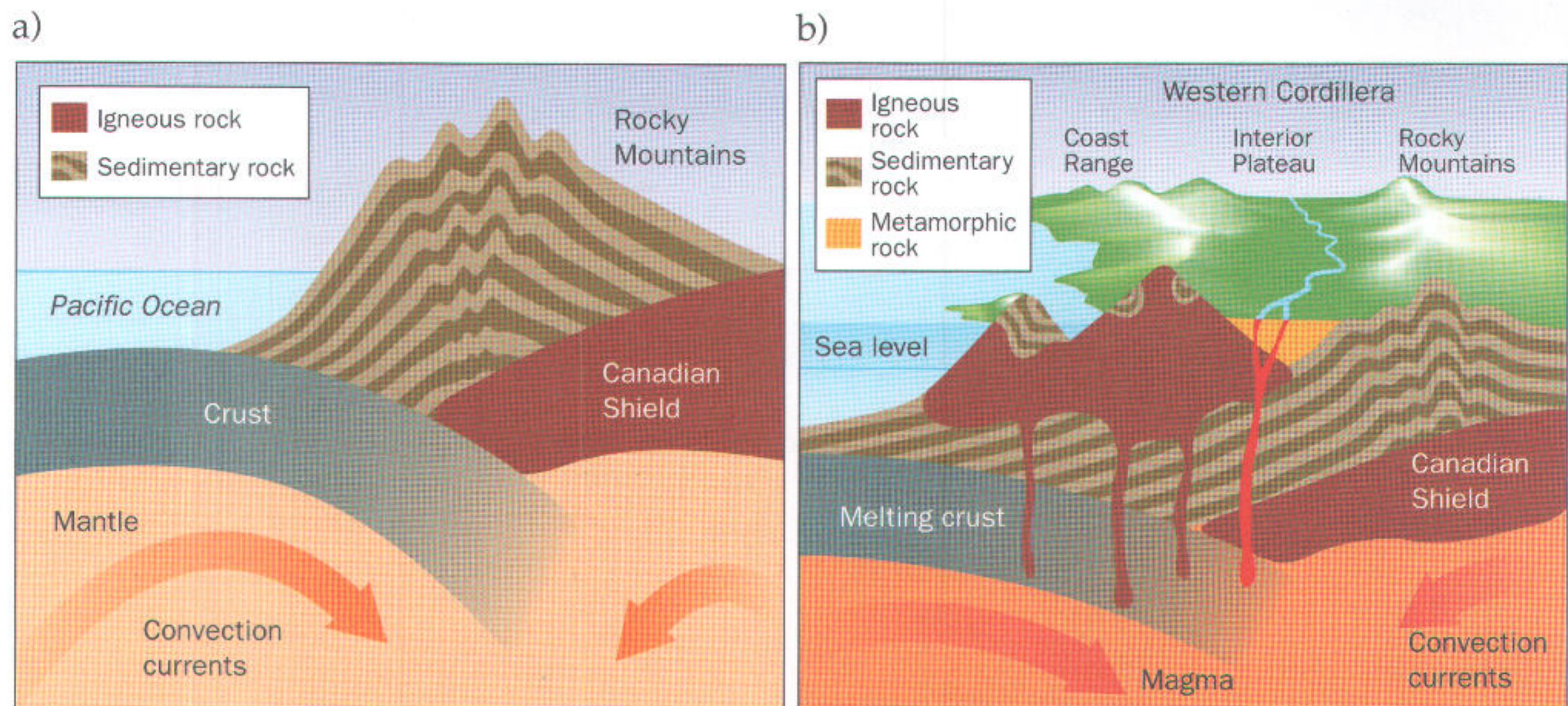
### To read a topographic map...

- ✓ look at the legend to understand the symbols
- ✓ use the military grid to pinpoint specific locations
- ✓ check the ratio scale to calculate distances
- ✓ analyze contour lines to identify physical features

## The Western Cordillera

British Columbia, the Yukon, and small parts of Alberta and the Northwest Territories make up a complicated landform region. The Western Cordillera ("cordillera" is a Spanish word for mountains) is a fairly young geologic region. It has three main parts, each formed in a different way. During the dinosaur age, plate movements folded the Earth's crust up to form the oldest part, the Rocky Mountains. Then, about 65 million years ago, volcanic eruptions farther west built the Coast Range along the Pacific Ocean. The lava flowed over the area between the Rockies and the Coast Range to form the interior **plateau**, an area of elevated land. Finally, alpine glaciers sharpened mountaintops into jagged peaks and cut wide, U-shaped valleys between them.





▲ **Figure 2.16:** Geologic formation of the Western Cordillera: a) folding of the Rocky Mountains; b) volcanism in the interior and coastal regions

22. Record one sentence in the text that describes what is happening in Figure 2.16a.
23. Record the sentence that describes the process shown in Figure 2.16b.

### The Human Geography of the Cordillera

The Western Cordillera is rich in resources. Coal deposits are found in the Rocky Mountains, while metallic minerals are mined in the Coast Range and on the interior plateau. Forests cover all three areas, while orchards in sheltered interior valleys yield grapes, cherries, and peaches. Mountain slopes and wilderness scenery attract tourists year round.

About one-eighth of Canada's people live in the region, with most concentrated in Greater Vancouver and Victoria. Smaller resource- and tourist-based communities are scattered along the coast and interior valleys. The Western Cordillera is a complex region with a growing population.

24. What natural resources help explain why so many people live in the Cordillera region?

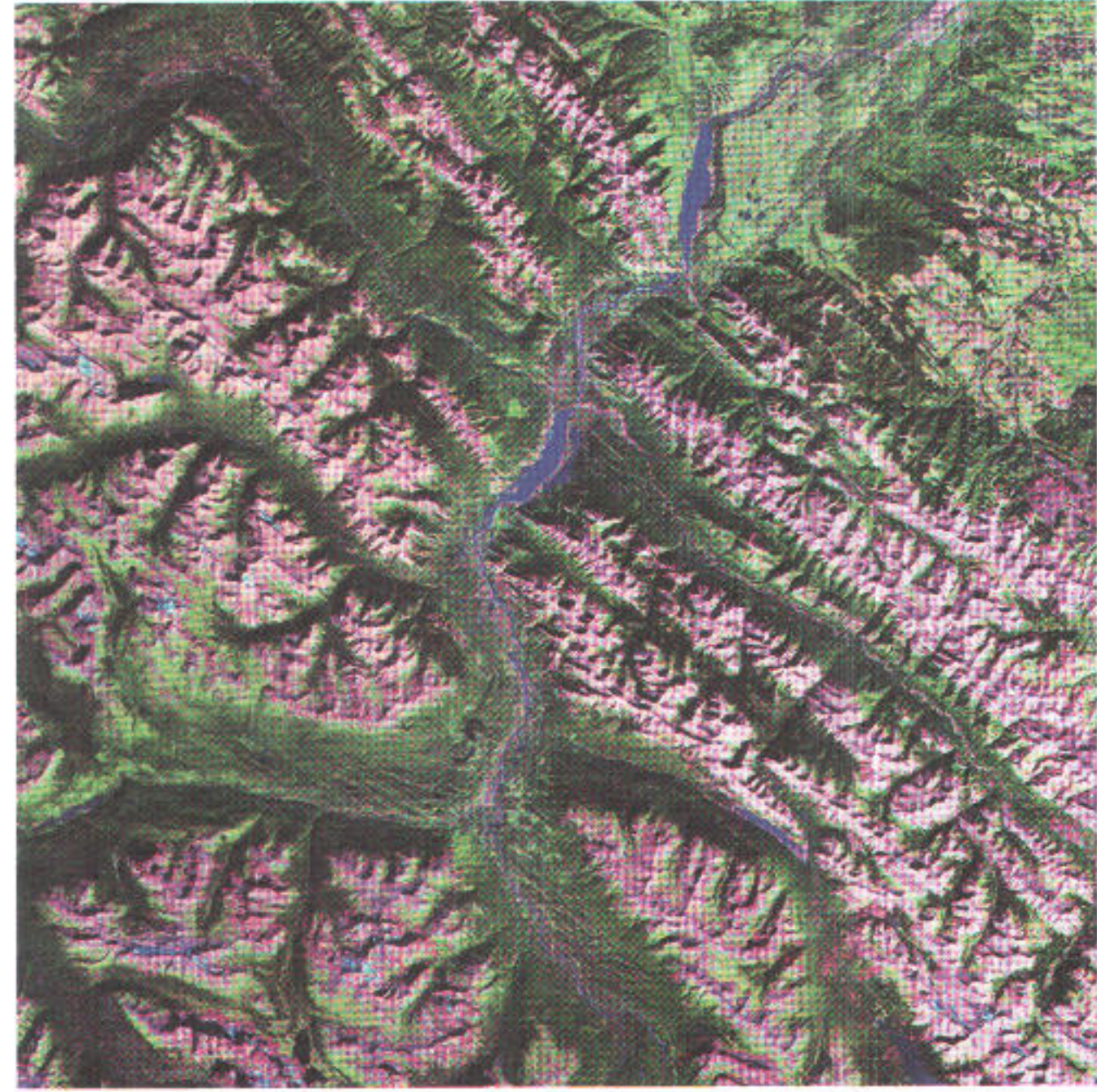
Figure 2.18 on the next page is a satellite image of part of the Western Cordillera region. A **satellite image** is a picture taken from space. Sensors detect light reflected from objects on Earth. A computer adds colour cues. Canada is a world leader in developing and using satellite information. Geographers use satellite images like this one to study physical features and natural resources.



25. Look at the photo of Jasper in Figure 2.17 below.
  - a) List the natural resources that you see.
  - b) Why is this a good location for a tourist community?
26. Look at the satellite image in Figure 2.18. What colours represent valleys and mountains in the image? Describe the appearance of the mountains. Do they appear as separate peaks or as chains?
27. How can you tell that these are folded mountains? What evidence do you see that alpine glaciers have shaped this area?



▲ Figure 2.17: Jasper, Alberta, in the Rocky Mountains



▲ Figure 2.18: Satellite image of the Rocky Mountains in Jasper National Park, Alberta

## The Innuitians

Canada is a bit like a car that has been in a lot of accidents. The surface has been crumpled up on almost every side by collisions. The Appalachians, the Rockies, and the Innuitian Mountains are all folded sedimentary rock pushed up from the ocean floor by plate movements.

The Innuitians, in Canada's far North, are younger than the Appalachians and older than the Rockies. They are mostly located on Ellesmere Island, with some low-lying parts on the Parry Islands and Queen Elizabeth Islands. Oil and gas deposits have been discovered here, good evidence that the Innuitian region was once covered by warm tropical seas. But it's not like that anymore; now these mountains are covered by large glaciers.

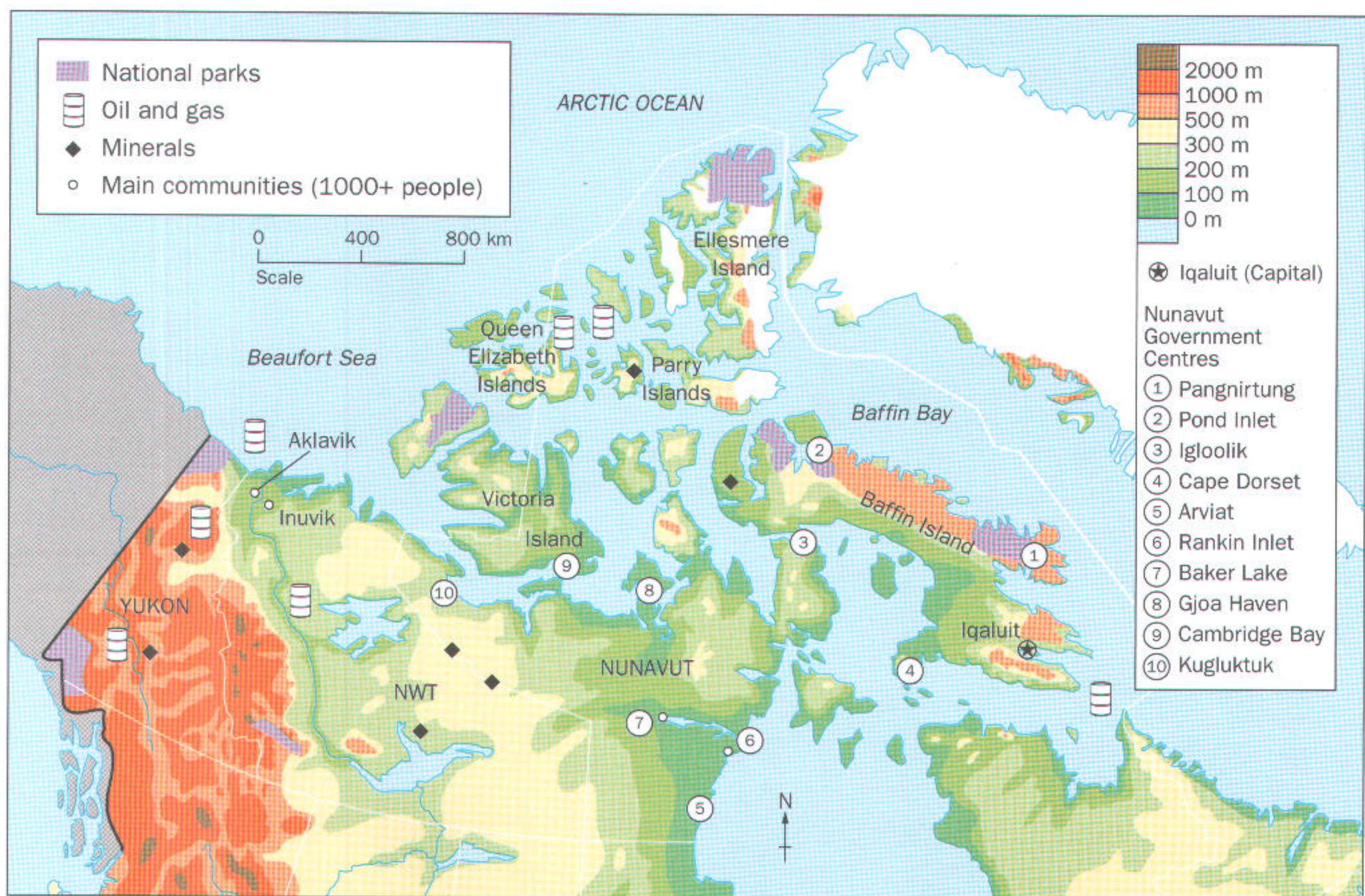
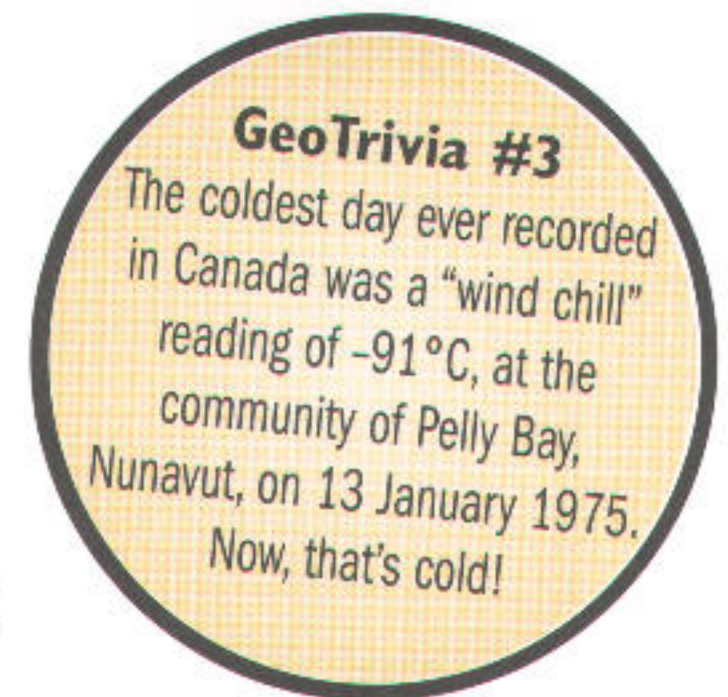
28. Explain in your own words how the Innuitian region was formed.



## The Arctic

It would be very easy to get lost in a blizzard in the Arctic region. In fact, many Arctic explorers died this way while searching for the Northwest Passage to the Pacific Ocean. The Inuit, who have lived here for thousands of years, have a deep respect for the power of nature.

The Arctic region is largely made up of islands formed from sedimentary rock. Most of the region was first scraped bare by moving ice, then drowned by rising sea levels as the ice melted. The surface is very stony, with **outcrops** of bare rock and very little vegetation. Oil and natural-gas deposits have been found near Inuvik. Both the Innuitian and Arctic regions are part of the new territory of Nunavut.



▲ **Figure 2.19: The Arctic region**

- Look at Figure 2.19. Compare the elevations of the eastern and western Arctic. What challenges to survival do each of these regions present?
- Why do both the Innuitian and Arctic regions have small populations?
- Describe the map distribution of each of the following.
  - Arctic communities
  - oil and gas deposits
  - national parks



## CASE STUDY

### NUNAVUT: MEETING REGIONAL NEEDS

Nunavut became Canada's third territory on 1 April 1999. The name means "our land" in Inuktitut, the language of the Inuit. The Inuit have always seen this northeastern Arctic region as a part of themselves, even after European traders of the Hudson Bay Company claimed it. After almost 15 years of negotiations with Canada, Inuit negotiators succeeded in getting direct ownership of about 350 000 km<sup>2</sup> (or 18 per cent) of the territory in 1993. They agreed to work with Canada to manage the resources in the rest of Nunavut.

The territorial government is faced with some unique challenges. Although Nunavut covers around 1 600 000 km<sup>2</sup>, it contains only about 27 000 people (about the same as the number of people living in Stratford, Ontario). As a result, government officials have had to find ways to serve small, isolated communities that are far from Iqaluit, the capital city.

Delivering government services, such as health care and education, is difficult. Even

delivering the mail can be a challenge! Winter temperatures of -50°C and frequent blizzards mean there are few roads to connect communities. In fact, Nunavut has a total of only 21 kilometres of highway! What's more, many settlements in the region are on large islands, cut off from the mainland. Any bridges would be torn apart by the annual movement of ice in the sea.

Air service is the best way to solve the problems of landforms, distance, and climate in Nunavut. *First Air*, the regional airline, connects sixteen communities to one another, to the capital city Iqaluit, and to the rest of Canada. This northern airline is owned by the Inuit of northern Quebec. A regular schedule is followed during the peak Arctic flying season from March to October. Doctors, nurses, and midwives, for example, can make regular visits to isolated communities. During the rest of the year, though, bitter cold, blizzards, and long periods of darkness make flights more hazardous and less frequent.



▲ Figure 2.20: Iqaluit, Canada's newest capital



These transportation problems led Nunavut officials to use a very decentralized form of government. This means that local government departments and agencies are being set up in ten communities besides Iqaluit. You can see these on the map in Figure 2.19 on page 51. This decentralization will help create jobs in all areas of the territory. It also makes sense because smaller, isolated communities know best how to meet their own needs.

Local government makes sense in another way. The Inuit have always had a very strong sense of responsibility to the community. For example, according to the Inuit concept of *Innuqatigiinniq* (community ties), the raising and education of children is everyone's responsibility. Therefore, local control over services such as education

make perfect sense both because of the land's daunting features and because of Inuit culture.

1. Summarize the reasons why transportation is difficult in Nunavut.
2. Brainstorm lists of advantages and disadvantages for Nunavut's type of government.
3. Suppose you lead the territorial government of Nunavut. Use the map in Figure 2.19 on page 51 to plan the following.
  - a) locations for airports to distribute supplies from Iqaluit
  - b) places that tourists might like to visit, and ways to get them there
  - c) ways to get the territory's oil, natural gas, and minerals to the rest of Canada

## Conclusion

In this chapter, you learned that many different landform processes have shaped our country during its long history. Searing volcanoes and slow, grinding plates built mountains. Water, ice, and wind continually wore down the surface and carried it to the sea. Four factors—size, time, mountain-building, and erosion—have created a country with seven different landform regions. People have populated each of these regions and used the resources to develop unique communities.

## Wrap It Up

1. Make a chart with the headings shown below. Fill it in with brief point-form notes about each of the seven landform regions you have studied in this chapter.
2. Explain the meaning of each of the following ideas used in the chapter.
  - a) Canada's land surface grew like a tree.
  - b) Canada is like a car that has been in a lot of accidents.
  - c) Nunavut is a new kind of territory.
3. Find out what types of landforms are located in your community and area. How have they affected the economy and population of your area? Prepare a short report, illustrated with a map, pictures, or both.
4. Look at the map of Canada's climate regions on page 33. Compare it to the map of Canada's landform regions in Figure 2.1 on page 37. Describe the climate patterns in each of the seven landform regions.
5. Look at an atlas map of Canada's population. Compare it to the map of Canada's landform regions. Record how population is distributed in each landform region.

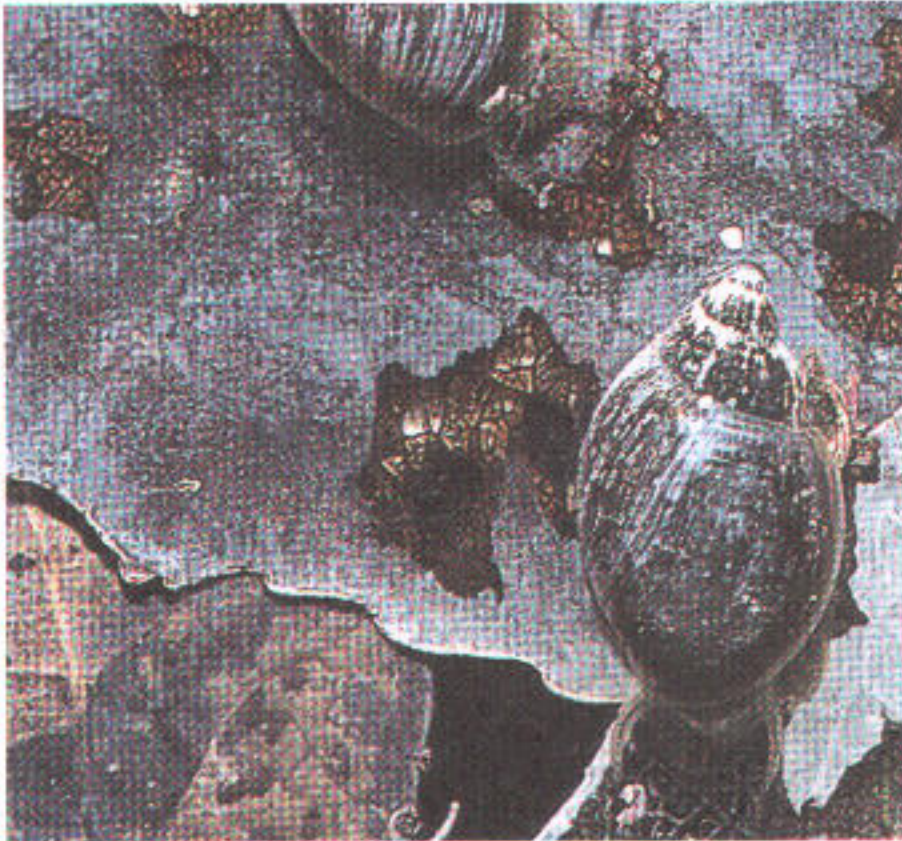
Landform Region	Formation	Resources	Population



# BIOREGIONS: BALANCED COMMUNITIES

### What Do These Animals Have in Common?

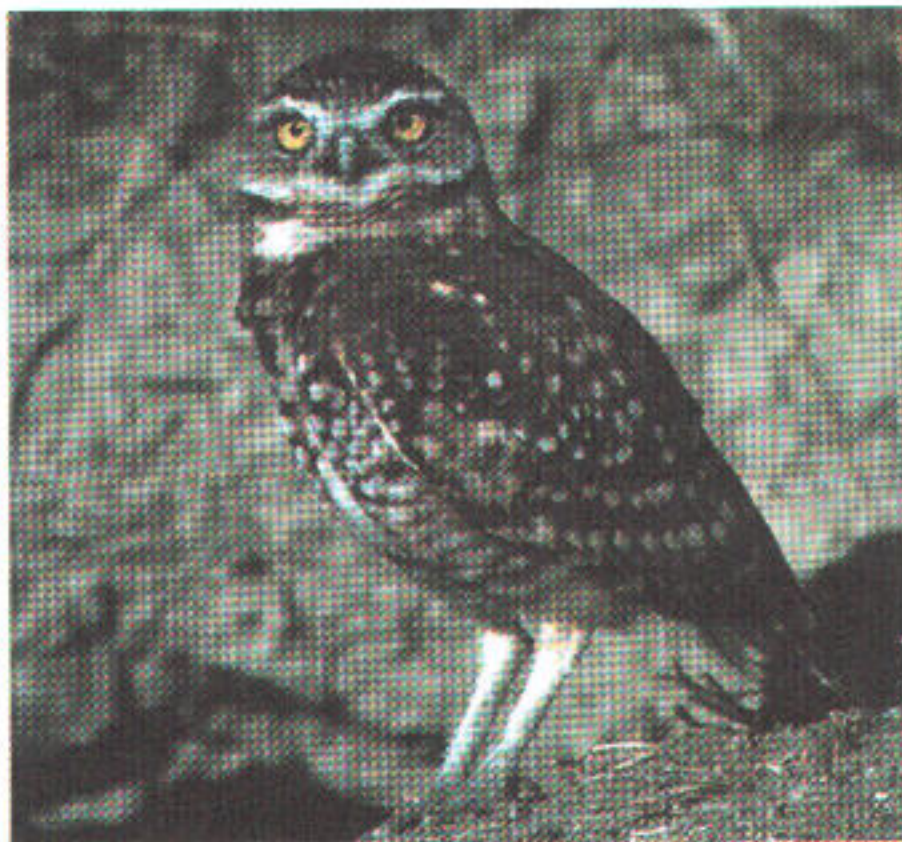
Each of these animals lives in a different bioregion of Canada. See if you can figure out what they all have in common. You will find the answer later in the chapter. (*Hint: It has something to do with where they live!*)



#### Banff Springs Snail

The Banff Springs snail lives exclusively in a very specific location: the hot springs in Banff National Park. It has adapted to conditions in which temperatures are high and there is very little oxygen.

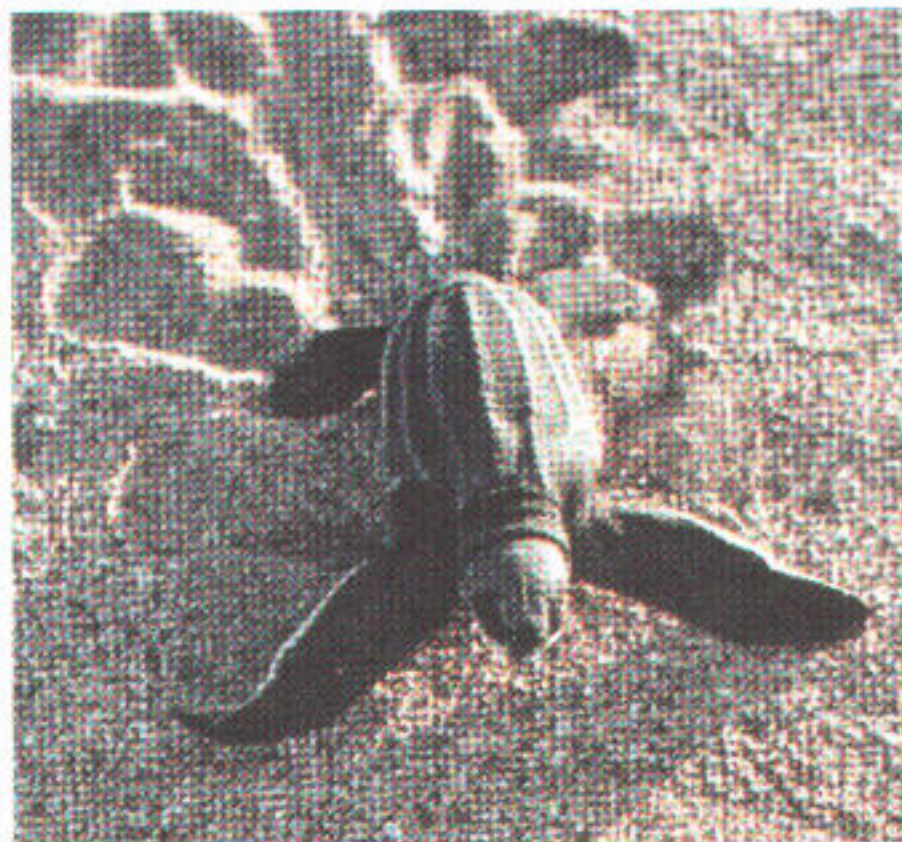
◀ **Figure 3.1:** A snail that loves hot water!



#### Burrowing Owl

Yes, an owl that lives underground! These small, brown birds take over burrows made by badgers, gophers, or prairie dogs. They redecorate by making the burrow bigger and adding leaves and grasses before laying their eggs. The burrowing owl can be found in Alberta, Saskatchewan, and British Columbia.

◀ **Figure 3.2:** An owl that digs!



#### Leatherback Turtle

These are the largest reptiles in the world; they can grow as long as two metres and weigh up to 636 kg. They are found in the Atlantic, Pacific, and Indian Oceans. In Canada, leatherbacks appear on the east and west coasts in the summer, where they feed on jellyfish. Leatherbacks are the only turtles in the world with a soft shell.

◀ **Figure 3.3:** A turtle with a soft shell!