

[Finally, there is a controversial] proposal by Vancouver-based Bennett Environmental Inc. for an incinerator that would remove PCBs, dioxins, and other dangerous chemicals from contaminated soils to be shipped here from across North America.

"I'll bet you 90 per cent of Kirkland Lake is in favour of it," says Enouy.

And, indeed, a spirited fight is shaping up over the Bennett project between ... Kirkland Lake's business community, and farmers and environmentalists from the Timiskaming area to the south. ...

People—especially the young—are voting with their feet as northern communities struggle to survive. The exodus that removed 29 000 people

between 1996 and 2000 is playing out almost everywhere, with most—21 000—headed to southern Ontario, according to Statistics Canada's François Nault.

Source: Kate Harries, "Snow, Smoke Are Inspiration for Town Built on Mining," *The Toronto Star*, Saturday, 23 March 2002, p. E4.

1. a) What is the reason that Kirkland Lake has gone into decline?
b) Give three specific examples of decline in the town.
2. a) Outline three proposals to bring new jobs to the town.
b) For each one, decide whether or not you believe it is a wise choice. Explain your conclusion.
3. On the basis of this article, what do you think will happen to Kirkland Lake over the next ten years? Explain your prediction.
4. Test your prediction. Use the Internet to research if new businesses or industries have started in Kirkland Lake.
5. Name a community you know that is struggling economically. How do you know? How is the community coping?

Assignment 4: Summarizing Urban Community Issues

As the final section in your scrapbook, you will present newspaper articles about urban Canada, both its character and the problems it faces.

1. Using local and at least some national newspapers, find articles or advertisements about different aspects of town and city life. The articles can focus on one community or Canadian urban communities in general. You may clip the articles from newspapers at home, photocopy articles from newspapers at the library, or print out articles from the Internet. These are the topics that you will research:
 - ethnic groups within the community (3)
 - attractions of the community (3)
 - businesses in the community (5)
 - what people do for recreation and entertainment (5)
 - problems in the community (4)
 - proposed changes for the community (3)
- Beside each one of the topics listed above is a number. This indicates the minimum number of articles or advertisements you need for that particular topic.
2. Organize your articles by topic, and glue them into your scrapbook. Leave space under each article. In this space, write a short summary of four to five lines.
 3. At the end of your newspaper clippings, write your summary of urban Canada. For each topic, write about at least one aspect that you feel is important. For example, select one problem that Canadian urban places face and briefly discuss it. Your summary should be at least one-half page long.

Unit 3

ECONOMIC INTERACTIONS



The Somewhere in Canada Contest #3

How have you done in these contests so far? Try your powers of investigation again, this time with the Somewhere in Canada Contest #3. Where in Canada do you think this photograph might have been taken? If you're not sure, look at the clues below.

- CLUE 1** ➤ The extensive mixed forest tells you this is a rural area. If you look carefully, though, you'll see a city in the distance.
- CLUE 2** ➤ The city is in Northern Ontario, right on the Canadian Shield. It has a very rocky landscape, with forests surrounding it and 330 lakes inside its boundaries.
- CLUE 3** ➤ This city has one of the largest nickel deposits in the world.
- CLUE 4** ➤ Find the largest human-made structure in the photograph. This is the tallest smokestack in the world.
- CLUE 5** ➤ Inside the city is a park called Big Nickel Park. It features a nine-metre-high copy of a Canadian five-cent coin.

What Will You Study in This Unit?

Can you guess why the city shown in the photograph developed where it did? Two valuable minerals—copper and nickel—were discovered here, and an important mining town took root in the region. A similar story can be told about communities all over Canada. Different industries developed, depending on the natural and human-made advantages found at a particular location.

In this unit, you will learn about the different types of economic activity that are common in the various regions of Canada. You'll encounter everything from Alberta's cattle ranching, to the automobile industry in southern Ontario. You will learn about the high-tech companies in specialized locations, as well as the service businesses that exist in every community. These are all part of Canada's economic systems.

Economic systems may be the most striking example of how Canada's human systems have teamed up with our physical systems. The way that we use natural resources can improve our economic living standard. But if we follow unwise practices, our economic activities can harm the environment and decrease our quality of life.

How does economic activity affect your life? Canada has a healthy economy based on natural resources, ingenuity, skilled workers, and world trade. A country with a healthy economy can provide young people with a real chance to prepare for a career. Get ready, and Canada's economic systems will have a good job for you one day.

In this unit, you will

- examine primary, secondary, tertiary, and high-technology industries
- analyze ways that Canadians use resources in Canada
- explain why different types of economic activity develop where they do
- understand how economic systems are linked by transportation and communication networks

For a challenge, try the Unit 3 GIS activity, "Mineral Mapper," on page 339.



Chapter 9

GATHERING NATURAL RESOURCES

Where's That Burger From?

Imagine you're walking along a street in small-town Ontario. You and your friends get a craving for some fast food, so you drop in at a fast-food outlet. You decide on a hamburger, fries, and pop. As you wait for your order, your mind wanders and you start thinking about what you're about to eat. What goes into a hamburger, anyway, and where does it come from?

There is no simple answer to this question because many ingredients go into a hamburger. Have a look at the photograph in Figure 9.1 below to see where your fast-food meal came from.



Words to Know

primary industry
fishery
aquaculture
location factor
hardwood
softwood
direct employee
indirect employee
selective cutting
clear-cutting
sustainable
mineral

▲ **Figure 9.1:** Where does your fast-food meal come from?

1. On a blank map of North America, show where each item in the photograph in Figure 9.1 came from. Draw a line from each source to your community. Which item travelled the farthest?
2. Choose three items, and suggest why each item originated where it did.

In this chapter, you will

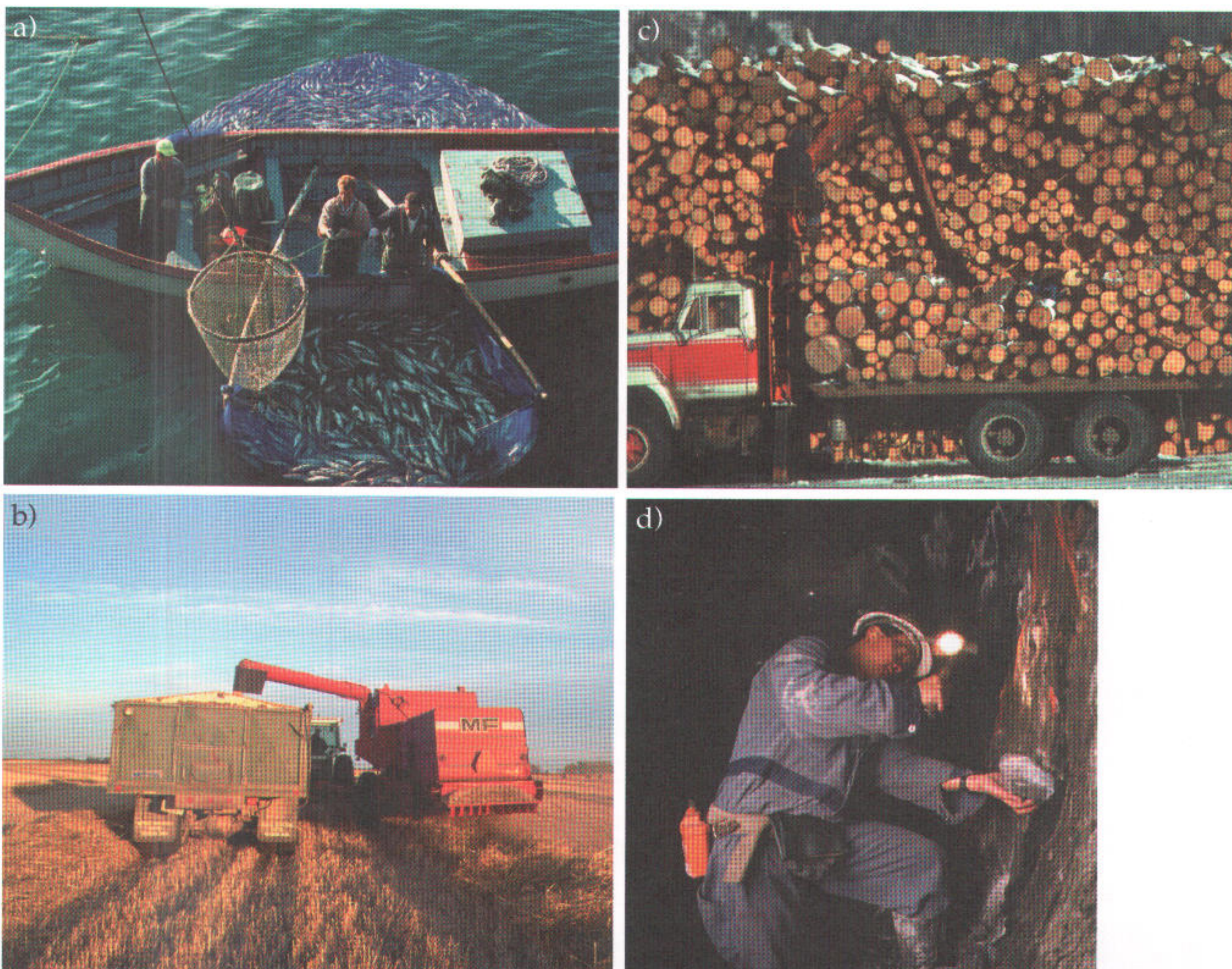
- identify Canada's primary industries
- find out about the jobs they provide
- learn how they use raw materials to create wealth
- assess location factors using photographs and maps

Canada's Primary Industries

Most of the raw materials that go into a fast-food meal are products of **primary industries**. These industries produce the raw materials that are eventually processed or manufactured into finished products. The farms that produced the meat for your burger, the potatoes for your fries, and the sugar for your pop are all examples of primary industries. So is the oil well in Alberta that produced the oil that was manufactured into the plastic fork you used.

3. What are primary industries?
4. Besides those mentioned above, identify three other items in the photograph on the previous page that are made by these three primary industries: grain farming, dairy farming, and forestry.

Certain primary industries are suited to Canada because of our natural environment. Rice farming, for example, is not a Canadian primary industry because our climate is not suitable. Look at the pictures below, and decide which Canadian primary industry is being illustrated in each photograph.



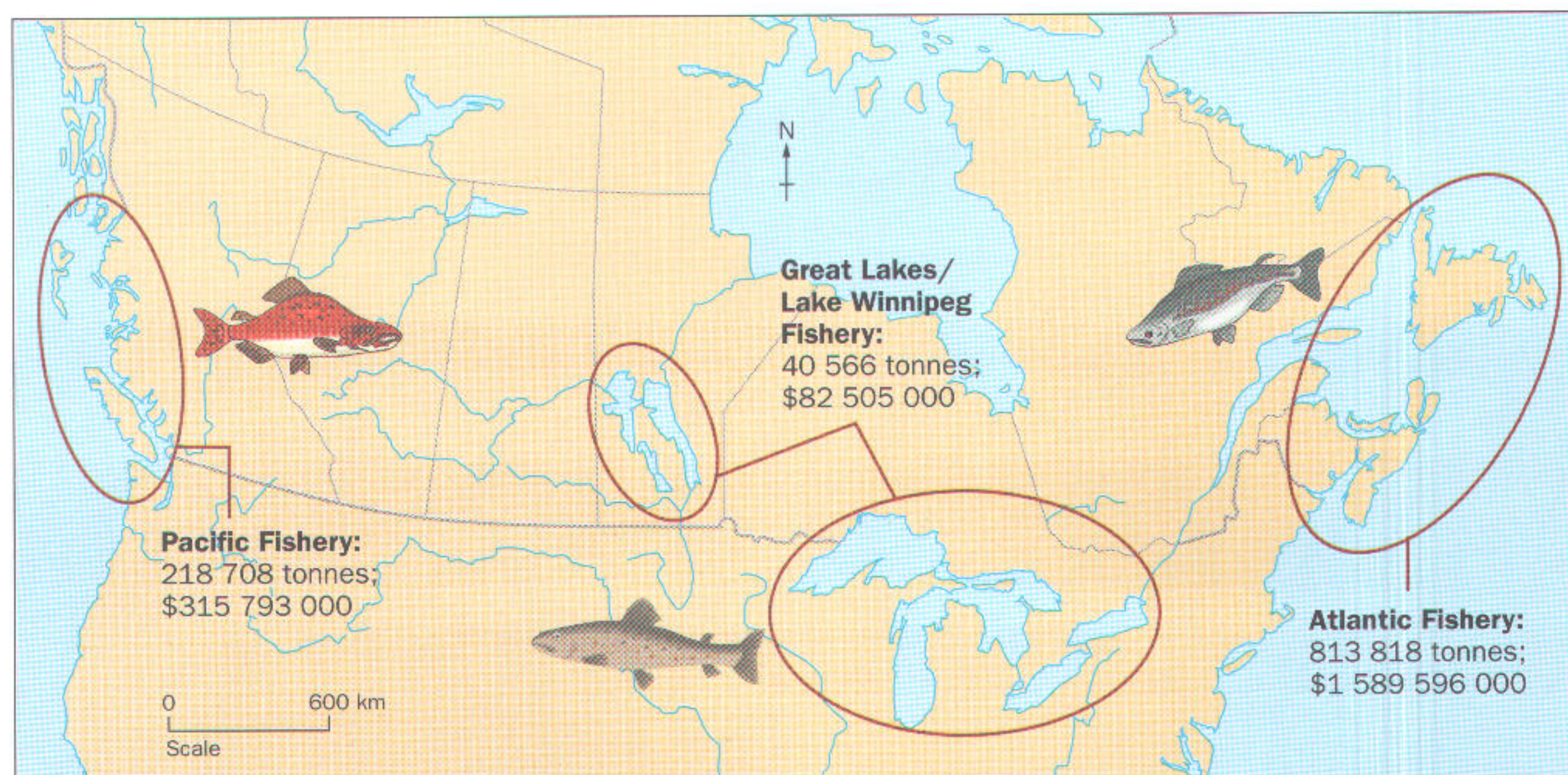
▲ Figure 9.2: Canada's four most important primary industries

5. The four primary industries pictured in Figure 9.2 on the previous page took place in New Brunswick, Newfoundland and Labrador, Saskatchewan, and Ontario. List the four primary industries, matching each one to a picture in Figure 9.2 (identify pictures by letter). Then match each industry with the correct location. You may wish to consult a natural resource map of Canada to aid you in your answers.

The Fisheries

You may go fishing in the summertime, and—if you're lucky—catch a big one. Perhaps you're happy you don't have to depend on the fish you catch to make a living. But many Canadians do fish for a living. The fishing industry has supported Canadian communities for many thousands of years, and continues to do so in both Aboriginal and non-Aboriginal communities.

The **fisheries** are commercial fishing operations, not private, recreational fishing. The major Canadian fisheries take place in the Atlantic and Pacific Oceans, and in the fresh waters of the Great Lakes and Lake Winnipeg.



▲ **Figure 9.3:** The weight and monetary value of the fish caught in Canada in 1999

6. Which fishery is the largest in Canada? How many times larger is it than each of the other two fisheries? Make your calculations by dividing the value of the largest fishery by the value of each of the other fisheries.

In 1999, about 24 200 commercial fishing vessels were registered in Canada. Some of these were independent fishers, who catch their fish on both big and small boats. They sell their catch to seafood companies for processing and shipping to market. In addition, fishing companies operate fishing fleets and huge fishing ships on the ocean. Some of these are Canadian ships fishing in both Canadian and international waters. Some of them are foreign ships that buy licences to fish in Canadian waters.

For various reasons, the populations of some fish species, particularly cod, have dropped substantially. The possible reasons include overfishing, global warming, and technology that is so effective it has become easier to find and catch fish. Echo sounders for finding fish, and well-designed, massive nets for catching them, are two examples of effective fishing technology. Commercial fishers have shifted from high-volume, lower-priced species of fish (like cod). Now they concentrate more on high-value shellfish, like lobster, scallops, shrimp, and snow crab. Value per tonne fished in 2000 was \$2058, compared with \$600.53 in 1992.

7. Usually, "more" technology is considered a good thing because it can bring many benefits. In the case of fishing, technology could be considered both good and bad. Explain.

Fish Processing

The fishing industry does not just catch fish. It also processes, ships, and sells seafood products. Canadian seafood companies purchase fish from Canadian fishers to process the fish and bring them to market in central Canada and the United States. In addition, these companies buy fish from foreign-registered vessels. Many ships from Spain, Norway, and Japan regularly sell some of their catch to Canadian processing companies.



▲ Figure 9.4: A fish processing plant in Sainte-Marie, Quebec

Over 90 per cent of Canada's fishing industry takes place in rural, coastal areas. Processing operations also cluster along coasts and lakefronts. Although these locations are somewhat remote, they bring the processor close to the source of the fish and other seafood products. Ever smelled a rotten fish? Not a pleasant experience. Fish spoil quickly, so they must be brought into port fast. After being frozen or refrigerated, the fish can then be transported safely by road, rail, or ship all over the world. High-value catches, such as live lobster, are flown to France and other European countries, for sale in stores and restaurants.

8. Fishing captains are not the only people who make a living from the fishing industry. Brainstorm a list of ten careers that exist either directly or indirectly because of the fishing industry. Check the text for hints (for example, the truck driver who transports fish to market).

Aquaculture

Aquaculture is fish farming. Instead of catching fish in the wild, the people who run aquaculture businesses grow fish and other seafood products. In a sense, they are the farmers of the sea. Some grow trout or salmon in fish ponds. Others grow fish, oysters, mussels, or clams in netted-off areas in the salt water of protected bays by the ocean. In 1999, aquaculture production in Canada was 113 083 tonnes, valued at \$558 million. Aquaculture provides an alternative to the traditional fishing industry, in which many people have lost their livelihoods as the numbers of fish have decreased.

GEO SKILLS

ASSESSING LOCATION FACTORS USING PHOTOGRAPHS AND MAPS



▲ Figure 9.5: A fish plant in Rose Blanche, Newfoundland

Purpose

Geographers and businesspeople study photographs and maps to identify location factors for businesses. **Location factors** are the reasons why a business locates where it does.

Companies set up businesses in particular places for good reasons. So why do fish processors locate their plants so far away from most of their markets in central Canada and northeastern United States? Take the following steps to assess the photograph in Figure 9.5, which shows a fish plant, and Figure 9.6, which shows a map of the area, to figure out why the company located its plant where it did.

Step 1

Analyze the photograph. You probably spotted the ocean right away. Rose Blanche is on the southwest coast of Newfoundland. You also probably spotted the fishing boat. Rose Blanche clearly provides a protected harbour, making it easy for fishing boats to bring their catch to land even in rough weather. Road access is also available.

Step 2

Analyze a map of the area. As you can see on the map in Figure 9.6, Rose Blanche is close to the Grand Banks. This shallow ocean area provides excellent fishing grounds. From the map, you can also see that Rose Blanche is close to the ferry that runs to the mainland, and has good road access to the central Canadian and northeastern American markets.

Step 3

Relate your findings to your knowledge of the business. Perhaps you remember from the previous page that fish must be brought into port and processed quickly to remain fresh. Access to rich fishing grounds and a safe harbour both contribute to achieving this goal. Perhaps you also recall that the fish industry's main markets are Quebec, Ontario, and the



▲ **Figure 9.6:** Location of Rose Blanche in eastern Canada

United States. The ferry and the highways to these locations can be used to transport frozen seafood products to market by truck.

To assess location factors using photographs and maps...

- ✓ analyze information in the photograph
- ✓ analyze information in a map
- ✓ relate what you find out to what you already know

Practise It!

1. Using Steps 1–3, assess the location factors for the aquaculture operation shown in the photograph in Figure 9.7. Refer to a map in your atlas to find Bras d'Or Lake in Nova Scotia, where this photograph was taken.



▲ **Figure 9.7:** A fish-farming operation in the freshwater lake of Bras d'Or, Nova Scotia

Forestry

Canada has vast stretches of forest, some owned by government and some owned privately. Commercial logging companies harvest the trees in these large forests. Not only do they cut down trees, they also build logging roads, assess timber, haul out the logs, ship them to sawmills, cut them into lumber, and finally ship them to market. Depending on the type of trees being cut, they are turned into paper products, like the pages of this book, or wood products for house and commercial construction.

GeoTrivia #1

A small Eastern Canadian Black Spruce tree with a trunk 15 cm wide at chest height can produce 12 500 sheets of computer paper, or 62 500 \$20 bills.

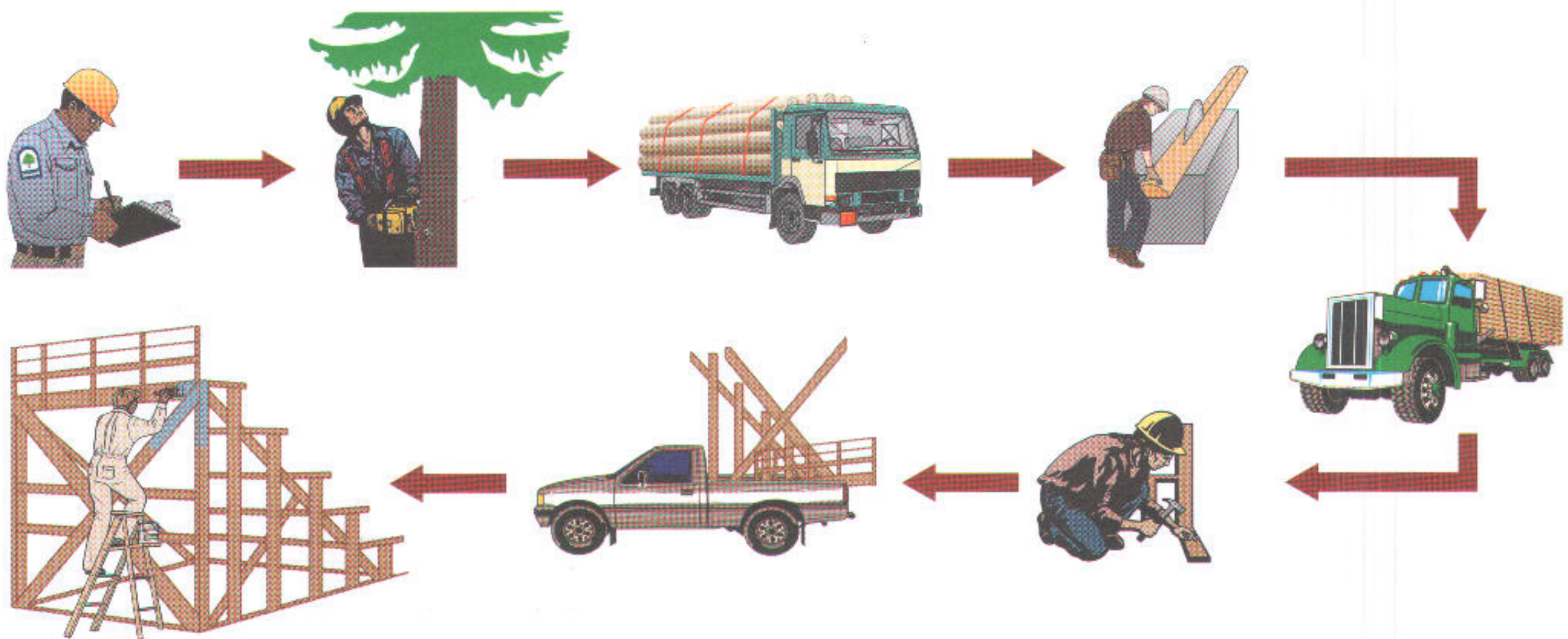
Deciduous trees—broadleaf trees—are called **hardwoods**. They take a long time to grow, so their wood is dense and hard. Hardwood is used to make flooring, for example, and fine furniture.

Coniferous trees—evergreens—are called **softwoods**. They can grow quickly, so their wood is soft, not dense. Softwood is used to make the framing for houses, for example, and roofing shingles. (You read about deciduous and coniferous trees in Chapter 3 on page 60.)

9. Explain the difference between hardwoods and softwoods.
10. Which wood—hardwood or softwood—do you think would be used to make a) baseball bats, b) packing crates, c) chopsticks, and d) skateboards? Explain your choices.

Taking Out the Trees

The harvesting and management of forests requires huge machines and lots of money. In 2000, over \$57 billion was invested in Canadian forestry companies to pay for the buildings, machines, transportation systems, employees, and licences required to carry on the industry.



▲ Figure 9.8: The route from getting a logging licence to sitting in the bleachers

Harvested trees must be transported over long distances to market. Some travel overseas as rough logs. Others are made into lumber and then sold both in Canada and abroad. Many of British Columbia's largest customers for construction lumber, for example, are the southern United States, California, Arizona, and New Mexico. Large trucks, like the one in Figure 9.2 on page 155, take the tree trunks first to the lumber mill to be cut into wood planks, and then to customers in the final market.

11. Many steps must take place from the time a company purchases the rights to harvest a softwood forest, to the time you sit on the wooden bleachers made from the trees in that forest. Put the following list in order to follow the process shown in Figure 9.8.

- cut trees; trim branches
- erect components into bleachers
- manufacture lumber into bleacher components
- mill trees into lumber at mill
- obtain licence to cut forest
- deliver bleacher components to school
- truck lumber to bleacher factory
- truck logs to sawmill

Forestry in Canada

The largest commercial forests in Canada are in New Brunswick, Quebec, Ontario, and British Columbia. The forest industry is of great importance to Canada's economy, as the table in Figure 9.9 shows.

Quick Facts about Forestry in Canada, 2000	
Total sales: \$59 billion	Amount exported: \$48 billion
Percentage of Canada's total exports: 12%	Number of direct employees: 257 500
Number of indirect employees: 772 500	Total log harvest: 196 million m ³
Source: Forest Products Association of Canada, "Quick Facts," < www.fpac.ca/english/facts/index.htm >.	

▲ **Figure 9.9:** The forest industry in Canada, 2000

Direct employees of an industry are people working for companies in that industry. Direct employees in forestry, for example, are those people working for forestry companies. **Indirect employees** of an industry work in support roles. Those who teach the children of families employed in the logging industry, for example, are indirect employees. So are cashiers in the supermarkets where forestry workers shop for groceries.

12. a) Refer to Figure 9.9. How many people worked in the forestry industry in 2000? How many were indirect employees of the forestry industry? In total, how many Canadians owe their employment to the forest industry?
- b) Calculate what percentage of the Canadian population is employed both directly and indirectly by the forestry industry. Divide the total number of employees—your answer to part (a)—by the Canadian population in 1999 (30 491 000) and then multiply by 100.
- c) What conclusions can you reach about the forestry industry in Canada?
13. Compare the total sales from the Canadian forestry industry in 1999 with the total exports. What do these figures tell you about the relative importance of exports in forestry?

Affecting the Environment

Forestry companies use several different methods to harvest wood. One is **selective cutting**, in which foresters identify particular trees to come down. Only these trees are cut down and taken out of the forest. The most common method of forestry is **clear-cutting**, in which a whole section of a forest is taken down, leaving only scrub behind.

Forestry companies prefer clear-cutting because it is both easy and quick. Cutting trees at a low cost is crucial for the industry to be profitable. Clear-cutting has been severely criticized for causing environmental problems, however. For example, without the roots of live trees, erosion takes place. Rain removes the best soil and sometimes causes mudslides on hills. Soil can get into salmon streams, preventing the salmon from breeding. Without older trees producing seeds, new trees will not grow. In addition, tourists don't like the look of clear-cut areas, so the tourism industry suffers.

The forestry industry needs to find a balance between efficiency and protecting the environment. Logging companies have begun to be more careful about where they clear-cut, and how they leave the land. For example, by clear-cutting in strips, forestry companies can avoid some of the harmful effects. Also, companies employ people to plant seedlings in clear-cut areas. Many college students work as tree planters for a summer.



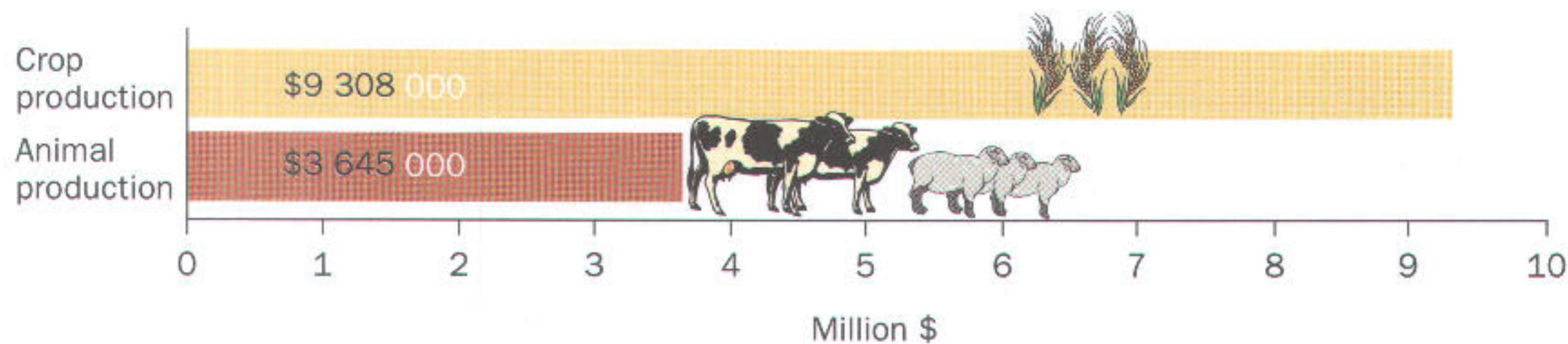
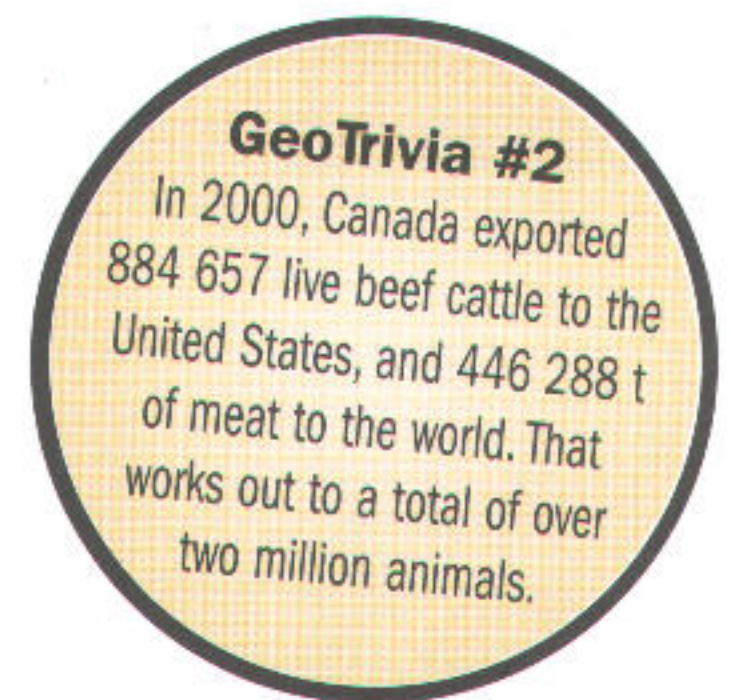
▲ **Figure 9.10:** Although only one in ten seedlings survives, tree planting does pay off with renewed forests.

14. a) Make a chart to compare the pros and cons of clear-cutting.
b) What can be done to lessen the harmful effects of this method?
c) What could you do to lessen your impact on the Canadian forest?
15. Consider this statement: "We must find a balance between human needs and the protection of natural systems."
a) What human needs are satisfied by the forestry industry?
b) Why is a balance required between these needs and those of the forest?

Farming

One could say that all primary industries “get the food on the table,” but none more so than farming. Farming, or agriculture, is a crucial Canadian primary industry. It provides jobs and brings money into the country, just like other industries do. It also provides the food we eat every day, whether it’s ice cream from the freezer, chips from the vending machine, or a hot dog from the school cafeteria.

Canada has two main types of farming: animal farming and crop farming. Crop farmers grow plants, including anything from wheat and canola to mushrooms and ginseng. Some animal farmers raise animals for their meat. Dairy farmers raise them for what they produce, such as eggs and milk. Most of the largest farms specialize in just one type of farming, but many smaller farms produce both crops and animals.



▲ **Figure 9.11:** Value of crop and animal production to Canadian farms, 2001

16. How many times more valuable is crop production than animal production?
Find out by dividing crop production by animal production.

Crop Farming

In Canadian crop production, grains are king. Crop farmers devote nearly 11 billion hectares of land to growing wheat. Much of that land is on the vast Prairies, especially in Saskatchewan. Here, the flat prairie land, the short but hot summers, and the plentiful spring rainfall are ideal for wheat farming. The photograph in Figure 9.2b on page 155 shows a combine at work on a Saskatchewan grain farm.



◀ **Figure 9.12:** Saskatchewan grain pours into a freshwater cargo ship in Thunder Bay, Ont. Look at the tugboat and buildings to get an idea about how big this boat is.

Wheat doesn't grow everywhere in Canada. Various regions of the country specialize in particular crops because they have the climate and conditions that especially suit those crops.

17. Take a look at the following lists of Canadian crops and farming areas.
- Match the crops with the right locations. (*Hint: Look at the ideal conditions listed for each crop. Try checking the farming areas in an atlas.*)
 - Write these crops in the correct locations on a map of Canada.

Figure 9.13:
Some Canadian
crops and
farming areas

Crop/Ideal Conditions	Canadian Farming Areas
1. wheat—most efficiently grown on huge, flat farms	a) red soil of PEI
2. grapes for wine—grow well in a climate like France's	b) Prairies
3. potatoes—grow well in nutrient-rich soils	c) protected climates of Niagara Peninsula (SW Ontario) and Okanagan Valley (BC)
4. cranberries—best suited to marshlands	d) Holland Marsh (north of Toronto) and Okanagan Valley
5. ginseng (a medicinal herb)—needs a long growing season and dry climate	e) bogs in the Muskoka region (Ontario) and Newfoundland and Labrador
6. onions—grow well on well-irrigated lands	f) marginal land in BC, Ontario, Nova Scotia
7. Christmas trees—grow well on low-quality farmland	g) warm climates in Annapolis Valley (NS), Niagara Peninsula, and the Okanagan Valley
8. fruit—needs protected, sunny climate	h) old tobacco farms of southwestern Ontario

Animal Farming

While most crops produced in Canada are exported, most animal produce is consumed by Canadians. For example, of all the beef eaten by Canadians, 82 per cent is produced in Canada.

As in crop farming, different areas of Canada specialize in farming different animals. For example, about 40 per cent of cattle and calves are raised in Alberta because it has fertile grasslands and plentiful precipitation. It is relatively cheap to transport meat to market in refrigerated trucks and railcars. So, although a majority of Canadians live in central and eastern Canada, most cattle are raised 3000 km away, in Alberta.

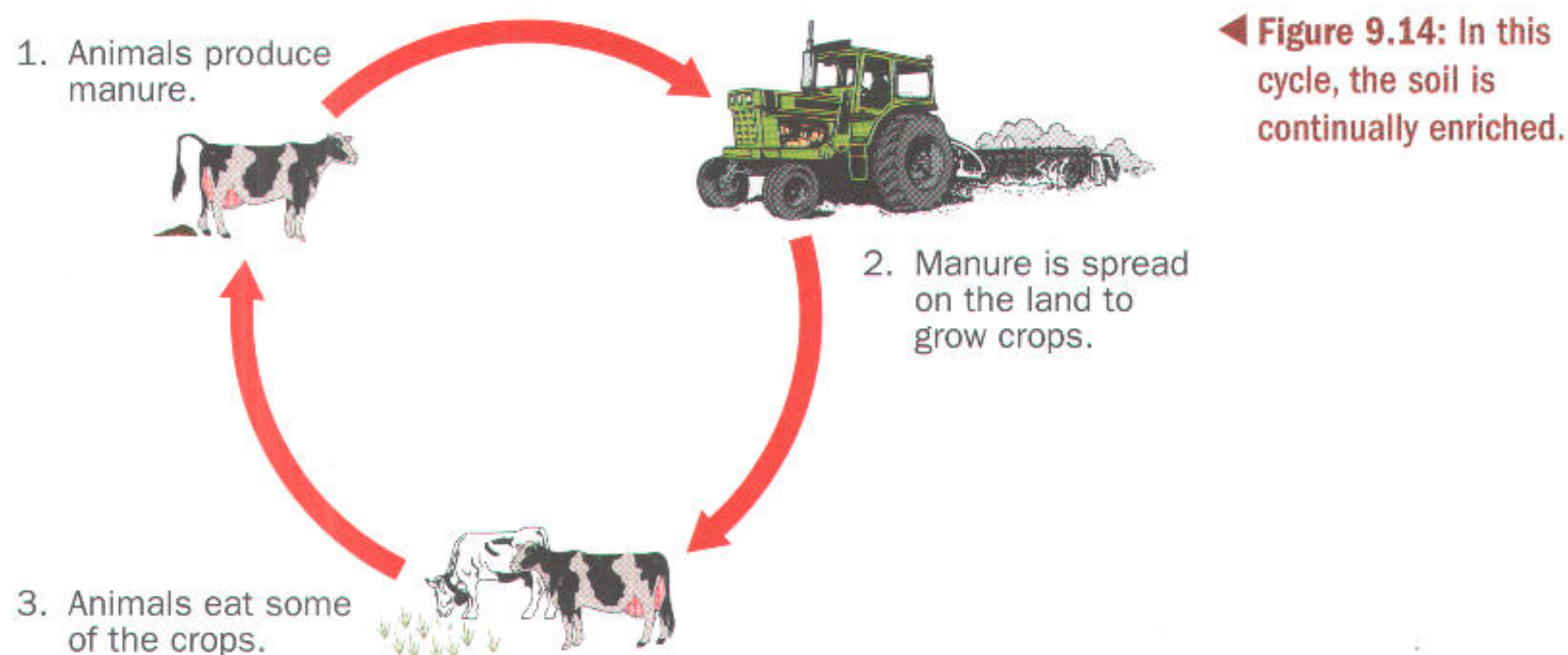
Dairy farming is an important activity in Canada. In 2000, farmers received \$4.1 billion from milk sales. This placed dairy farming in third place, with only grains and red meat ahead of it. Dairy farming has quite different location factors to consider than cattle farming. Milk does not keep well, so you cannot transport it over long distances. Dairy cows must be milked twice a day, so they have to be kept fairly close to a milking shed. Further, considerable labour is involved in milking a herd of cows, so herds are smaller. All these factors limit dairy farm size. Local dairy farms tend to be scattered across the country.

18. How are the location factors for beef and dairy farming different? Which one (or both) is well suited to your region of the country? Why?

Affecting the Environment

Farming has a continued effect on the land, largely because we put things on crops to help them grow better. To protect their crops, farmers spray on pesticides. These are chemicals that kill insects, weeds, or fungi. While these chemicals do allow the plants to grow better, they can damage the environment. For example, in Prince Edward Island in 2002, rain washed pesticides off potato fields and into streams, killing large numbers of fish.

Farmers add fertilizers like manure to the soil to enrich it.



Untreated manure on land can pollute the environment, however. Rain can wash it into rivers, streams, and wells, polluting human drinking water. This occurred in the town of Walkerton, Ontario, in May 2000. Seven people died and hundreds became seriously ill.

A **sustainable** farm system is one that will flourish into the future without harming the environment. The sustainability of Canadian agriculture depends on our ability to protect the environment from the effects of agriculture. Farmers recognize this need, and farm organizations everywhere place great emphasis on protecting the environment.

19. In what way can animal manure be a) a benefit to farmers and b) a problem?
20. a) Identify how the environment affects farming.
b) Identify how farming can affect the environment.
c) How are farming, humans, and the environment interconnected?

Mining

Canada has a hidden treasure: its store of minerals. **Minerals** are natural substances that we value because we can use them for something. They fall into three categories:

- *Metallic minerals* are metals, such as gold, nickel, and iron ore.
- *Structural minerals* are non-metallic minerals, such as cobalt, potash, sand, and gravel.
- *Fuel minerals* are fossil fuels, such as oil, natural gas, and coal.

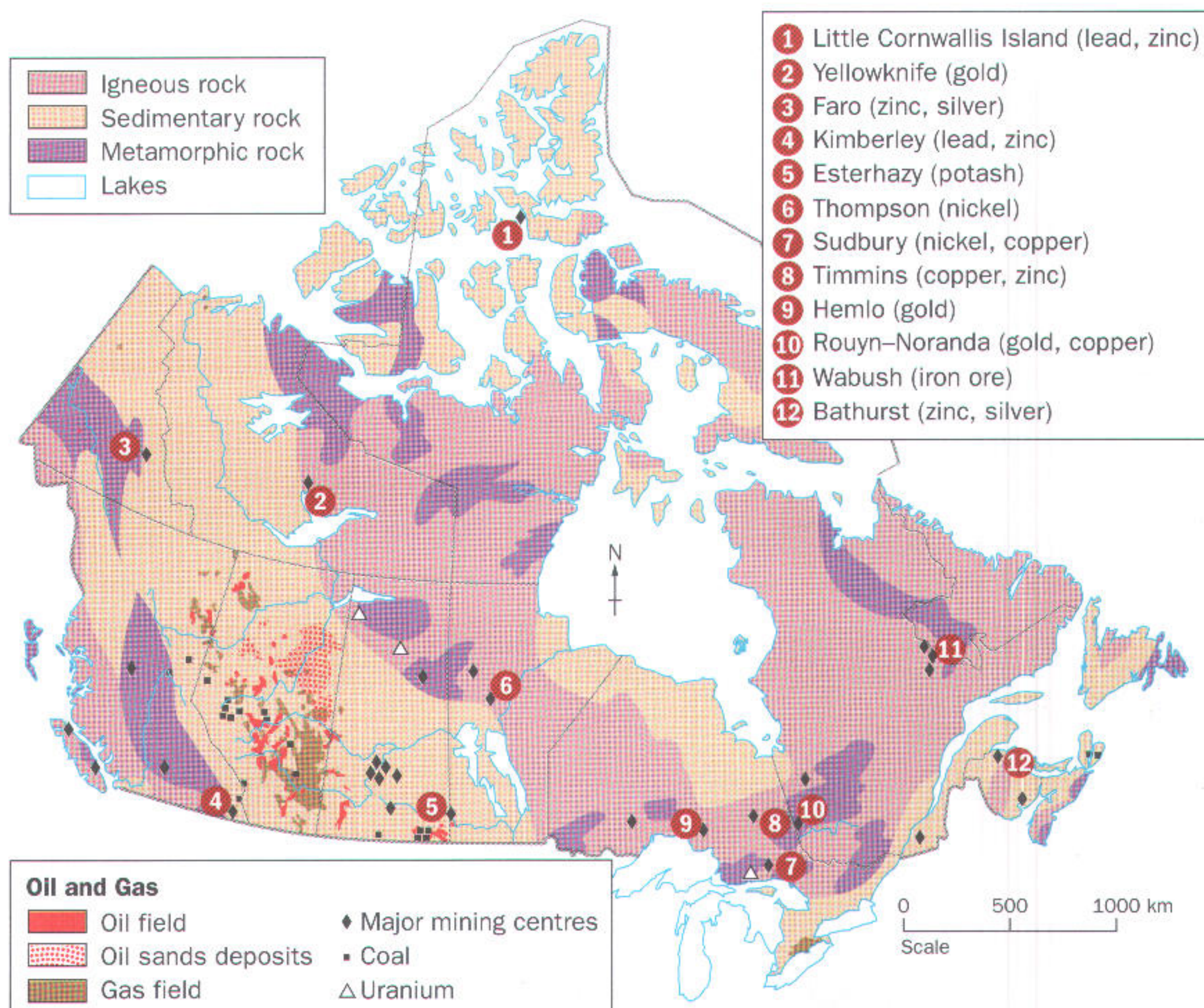
GeoTrivia #3
The Creighton Deep Mine, in Sudbury, Ontario, will be 2685 m deep by 2019. This could bury Toronto's CN Tower 4.5 times over.

21. Describe each of the three types of mineral. Give one example of each, and explain a way that we use this mineral. For example, we use iron ore to make steel.

Why are minerals a hidden treasure? Unlike forests and agricultural lands, minerals generally do not appear on the surface of the land for all to see. Instead, minerals are normally found only in hidden pockets, sometimes far beneath the surface of the Earth. Prospectors—professionals who search for minerals—may spend years looking for minerals before they hit a “big one.”

Where would you look if you hoped to discover gold or oil? Mining geologists have learned that valuable minerals can be found in particular kinds of rock. They understand, for example, that Northern Ontario and Quebec have gold mines, while Alberta has most of Canada’s oil and gas.

The map in Figure 9.15 shows that Canada has three main types of rock. Most of the igneous rock (created from molten magma) is found in a wide ring around Hudson Bay. Great expanses of sedimentary rock (rock formed from compressed layers) are found in western Canada and several other regions. Metamorphic rock (rock changed by heat and pressure) occurs in big patches across the igneous rock areas. What is mined in each of these rock zones?



▲ Figure 9.15: Mining in Canada

22. Identify different minerals listed in the map legend that are used to make coins.
23. Look at the map in Figure 9.15 on the previous page. In which type of rock are the fuel minerals—coal, oil, and natural gas—found?
24. a) List six different types of metal mined at the numbered locations shown on the map.
b) In which type of rock are most of these metals mined?
25. Explain in your own words why it is important for mining geologists to know the characteristics of different rocks.
26. a) Describe the pattern of mineral resources in Canada. Which province has most of the fuel minerals? Where are most of the large mines?
b) Identify the provinces that probably benefit the most from each of the mineral resources.

Quick Facts about Mining in Canada

- Number of people industry employs: 350 000
- Number of communities in which mining is the key industry: 150
- Of the total volume of exports loaded onto ships, the percentage that are minerals: 63%

Source: Statistics Canada.

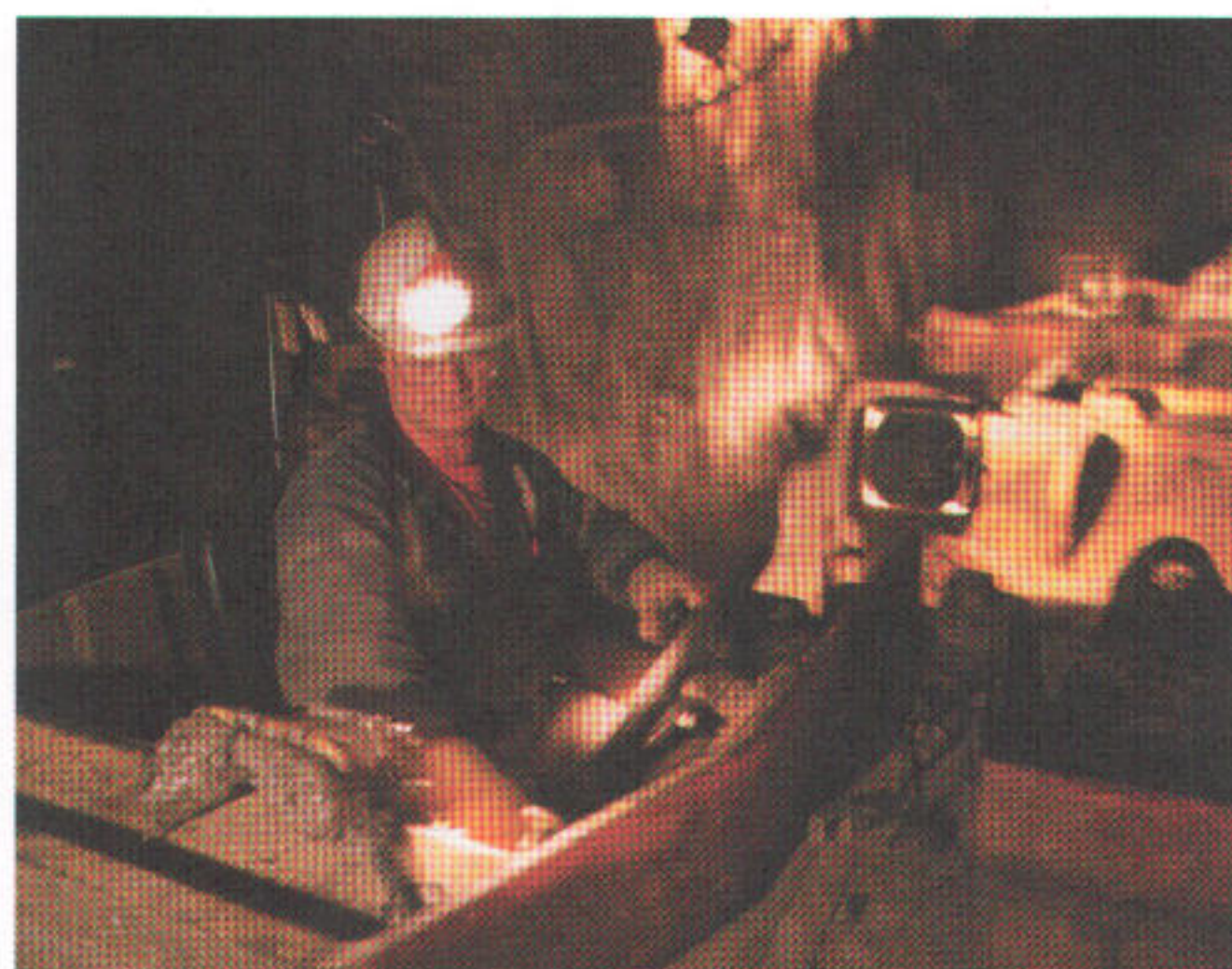
◀ **Figure 9.16:** The mining industry in Canada

Digging for Minerals

Mines are built in one of two ways. If the minerals lie close to the surface, mechanical diggers just dig a big pit and haul them out. These are called open-pit mines. The Athabasca oil sands project in Alberta uses this technique to get at the oil that lies buried there.



▲ **Figure 9.17:** Open-pit copper mine in Logan Lake, BC



▲ **Figure 9.18:** Driving a big rig 888 m down in the Hemlo gold mine, north of Lake Superior in Ontario

If the mineral lies deep beneath the surface, underground mines are built. Deep shafts, or vertical tunnels, are bored down into the Earth. At varying levels, tunnels called stopes are bored horizontally to gain access to the mineral-bearing rock. Miners go down the shafts and along the stopes to cut out the rock with jackhammers and other digging equipment. It can be dangerous work, and mining accidents are fairly common.

27. Explain the difference between the two basic types of mining. Give examples of the dangers of each type.

GeoGames

The Mining Game

Purpose:

Play this game to learn how difficult it can be to hit gold or other ore in a mine.

Mining is not like shopping for milk. (You're sure to find milk every time you go to the store.) Mining is more like shopping for a rare CD—you may do a lot of searching before you hit "gold." Mining is a hit-and-miss operation that involves digging through masses of rock in the hopes of maybe finding real gold. You give it a try.

Supplies:

- Copy of mineshaft map, Figure 9.19 (see next page)
- One die
- One playing piece per player

Method:

- Play with two or three other students. Each of you represents a miner trying to win the company's prize for taking the most gold out of the mine in a week.
- Make up a score sheet with the players listed across the top and the five days of the work week listed in the first column.
- Place your marker in the frame house (the building at the top of the mine shaft).
- Each of you takes a series of three rolls to represent Monday's shift, as follows.
 - Roll the die. Move your marker down the shaft by the number you roll.

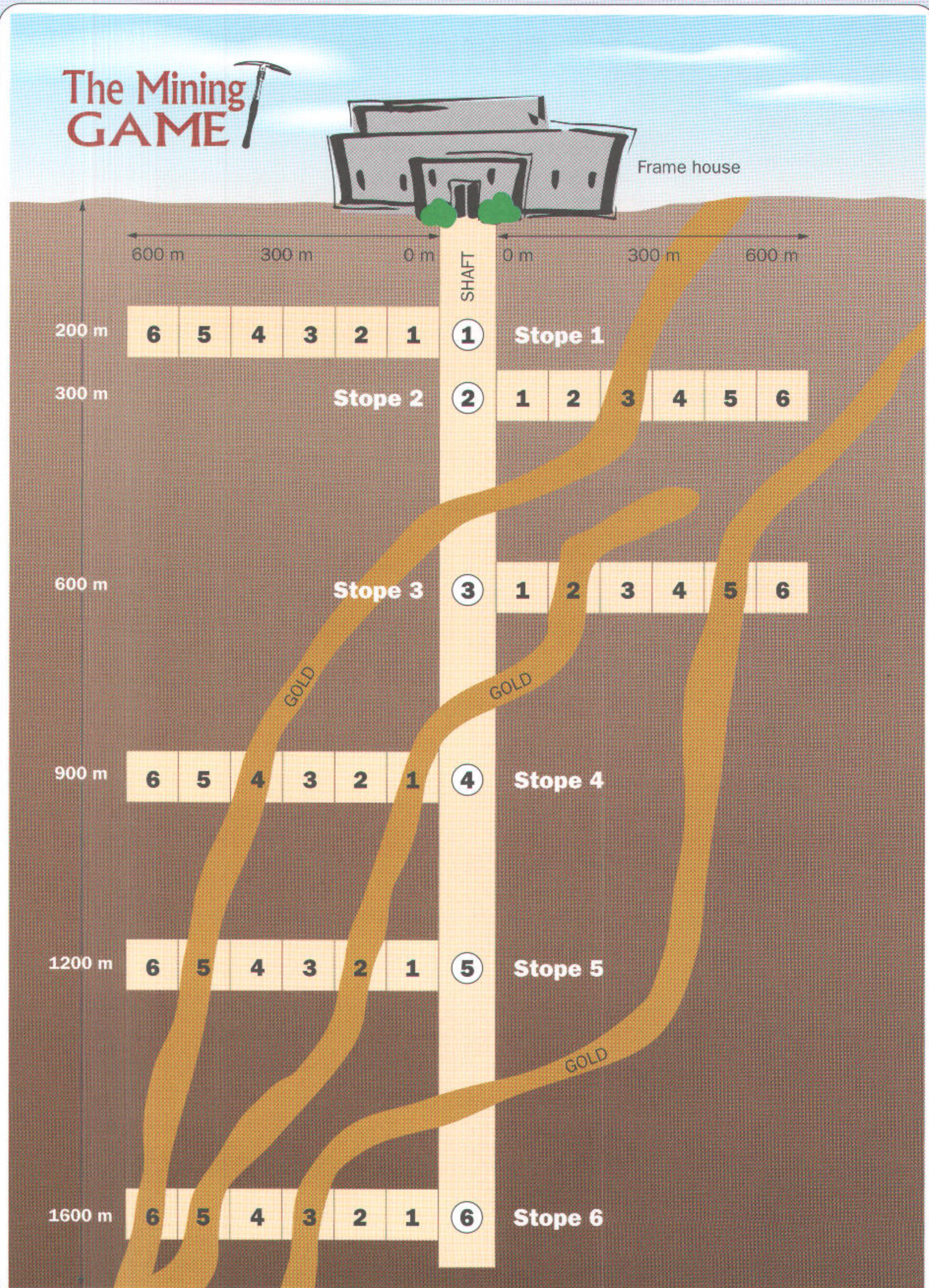
- Roll the die again. Move your marker sideways into the stope by the number you roll. If you do not land in an area that contains gold, your turn is complete. You blasted through tonnes of rock but found no gold today. Your score for the shift is zero.

- If you did land in a place that contains gold, roll the die again. You blast through rock and find the number of ounces of gold that are indicated on your die. Your score for the shift matches your final die roll.

- After all players have taken a turn, put your markers back in the frame house. Each player, in sequence, takes four more turns to represent Tuesday's to Friday's shifts.
- Total your week's scores. The player with the highest score at the end of the week has extracted the most gold and is the winner.

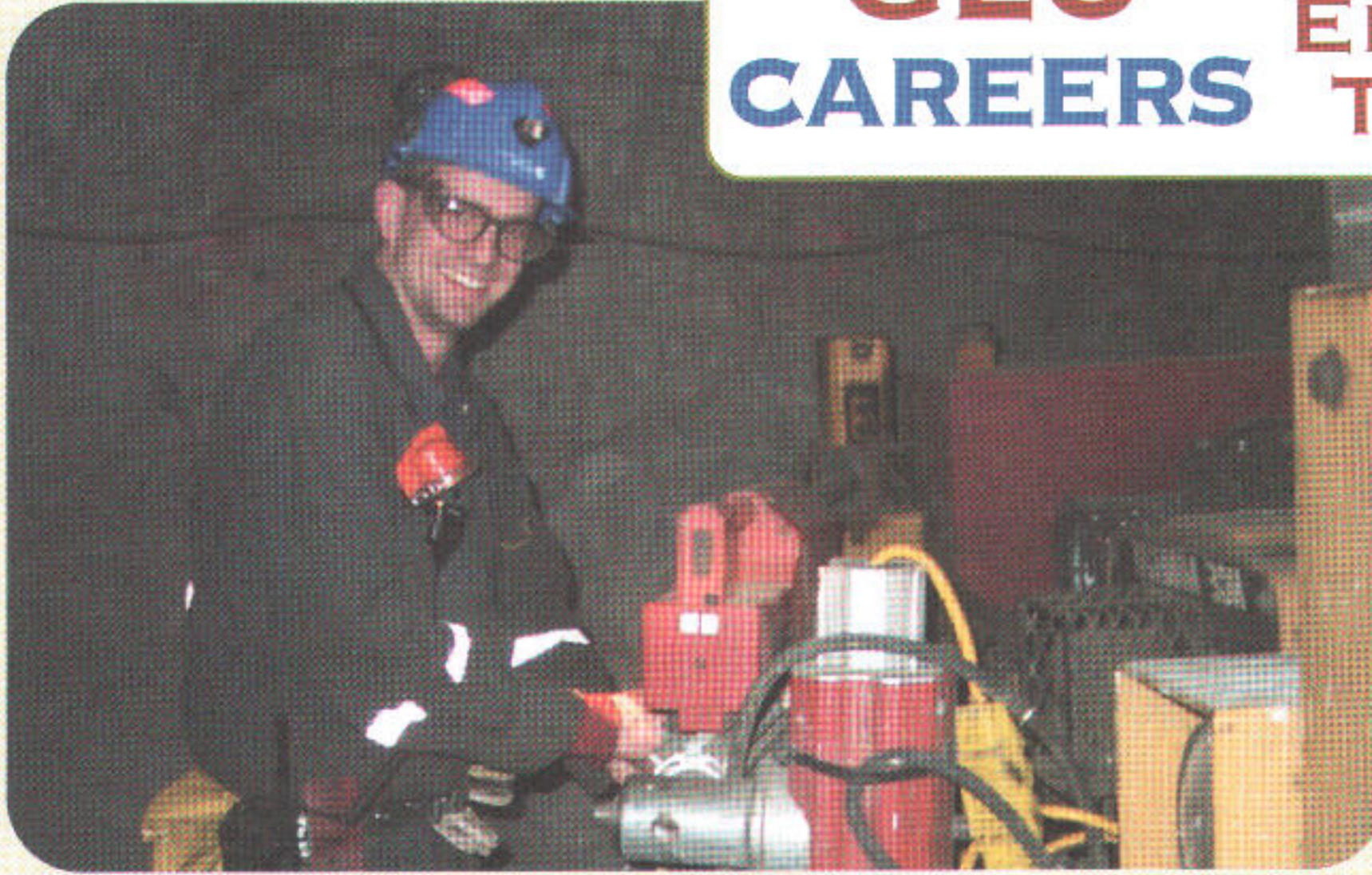
Wrap-Up:

- Did luck play a big role in whether or not you hit gold? Mining is like that, full of risk. Mining companies study the rock carefully before deciding to build an expensive mine. Sometimes mines run out of ore very quickly. Other mines are very profitable.
- Would you like to be a miner? Think of the advantages and disadvantages.



▲ Figure 9.19: Playing board for the Mining Game

GEO CAREERS MINING ENGINEERING TECHNICIAN



Name: Rob DesRivieres

High School: St. Patrick's High School, Sarnia, Ontario

Job Title: Mining Engineering Technician

When Rob DesRivieres was seventeen, a tour of a northern mine sparked his interest in mining. This led him to complete a two-year Mining Engineering Technician diploma at Cambrian College in Sudbury, Ontario. One summer, he worked at an open-pit coal mine, driving gigantic haul trucks. He also worked underground at gold and nickel mines, where he used precise instruments to survey new tunnels. Mine survey methods are similar to those used by land surveyors when they set out property boundaries.

Rob did plenty of camping and canoeing when he was young. That gave him practice reading maps. He also enjoyed working with computers. These skills have come in handy in his career.

According to Rob, Canadian mine technicians are second to none: "Anyone trained in mine technology here can work around the world," he claims. "We have high-tech mines where operators use joysticks and television screens to work rock faces thousands of metres below them."

Postscript: Rob recently graduated as a Mining Engineer from Laurentian University. If you would like to work in this field, you can start by getting a college diploma in Mining Engineering Technology.

What I like about my

work: "Mining is interesting because there is always something new.... When I was up in Red Lake, there was a working area that looked like a jewellery store. The rock face was full of veins with heavy gold concentrations that gleamed under our lamps."

1. What parts of his career does Rob seem to enjoy?
2. How did Rob's interests and skills help lead to his career?
3. Find out what secondary school courses are required to enter a college program as a Mining Engineering Technician.

How a knowledge of geography helps me in my job: "You need to be able to read maps well. In fact, now I mostly work with three-dimensional maps on the computer. They show the surface and what's underground, too."

Conclusion

You have seen in this chapter the variety to be found in Canada's primary industries. These powerhouses produce the food you eat, the materials needed to build your home, and the fuel to heat it. Primary industries provide employment and income for Canadians. They are vital to our economy and the Canadian way of life.

Wrap It Up

1. Make a copy of the following organizer, and complete it with information from this chapter.

Type	Where Located	Types of Product	Important Statistics
Fisheries			
Forestry			
Farming			
Mining			

▲ **Figure 9.20: Canada's primary industries**

2. Write a paragraph in which you state
 - a) what you think is Canada's most important primary industry, b) why you have this opinion, and c) what you think might be the advantages and disadvantages of working in this industry.
3. The raw materials come from the natural system. Fast-food outlets are part of a human system (restaurants). What other human systems will help get your next fast-food meal into your belly?
4. Choose fishing, farming, or mining. Create a diagram with visuals that shows all the processes through which the product goes, and how it is transported along the various stages of its production. Explain to a small group of students what you have shown in your diagram. (See a similar diagram for forestry in Figure 9.8 on page 160.)
5. Investigate a specific primary industry in your province or territory so that you can write a case study about it. Find out three of the following facts:
 - a) where it is located
 - b) why it is located there
 - c) the various stages the product goes through in its preparation for market
 - d) how it is transported to market
 - e) some figures to show how much of the resource is produced
 Government agencies, which maintain Web sites, are good sources of information. Prepare notes so that you can present your case study to a small group or the class.

Chapter 10

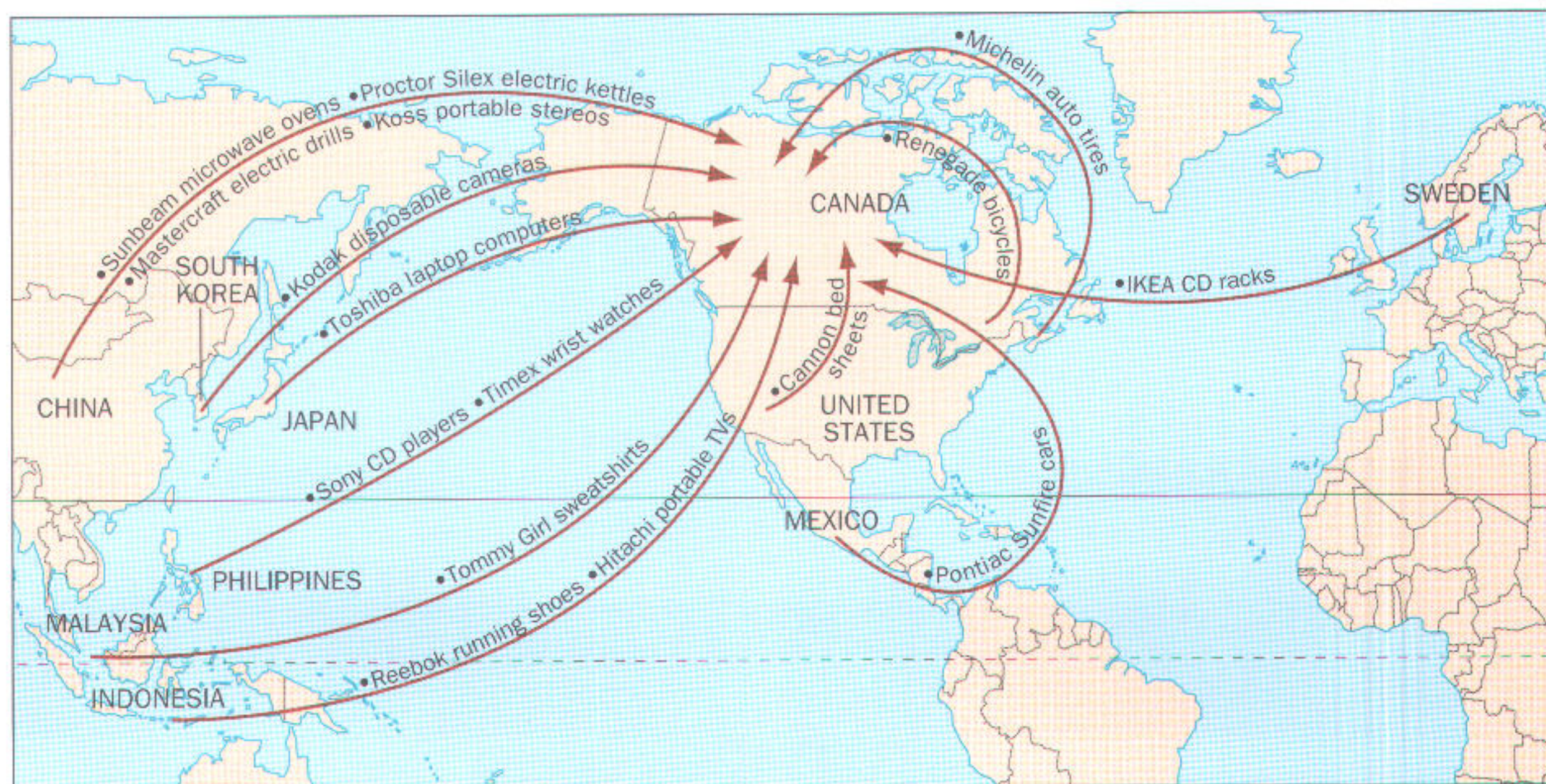
PROCESSING NATURAL RESOURCES

Things People Make

Manufactured products are things that people make. Stop for a moment and think about the many things in your life that have been made. They're in your backpack, in your locker, in your home, and on your body. In fact, even your backpack, locker, and home are manufactured things.

Where do these products come from? Let's check it out. First let's look at a map that shows countries that make many products Canadians like to buy.

Figure 10.1:
Source countries
for some manufac-
tured products ▼



Words to Know

manufactured product
secondary industry
manufacturing
construction
export
import
semi-finished product
molten
component
specialist parts supplier
efficiency
just-in-time delivery

- a) Check your shoes to see where they were made. Now check your binder, backpack, cell phone, calculator, sweater, or other handy item. Mark all the countries on a class map.
b) Describe the general pattern of your class map. Describe the general pattern of the map above. Do they match? What can you conclude about where goods are made?

In this chapter, you will

- consider why secondary industries locate where they do
- identify the different types of secondary industry
- focus on a few different secondary industries
- find out how the goal of efficiency has changed how industries operate
- produce a case study of a local business