

# Grade 10

## 20F Geography

### Resource Unit

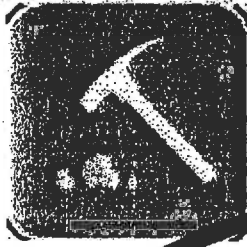
\_\_\_ Natural Resources

\_\_\_ Canada's Forest Resources

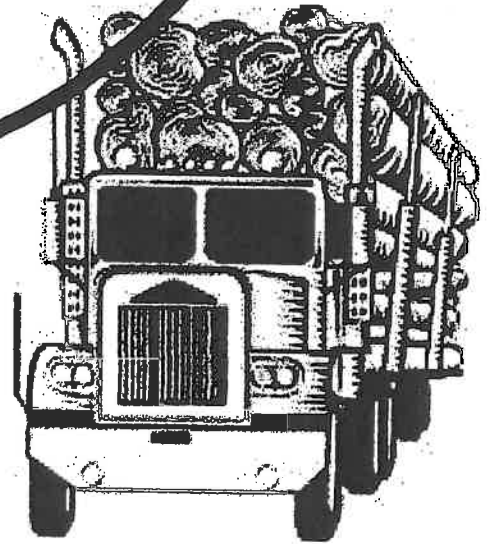
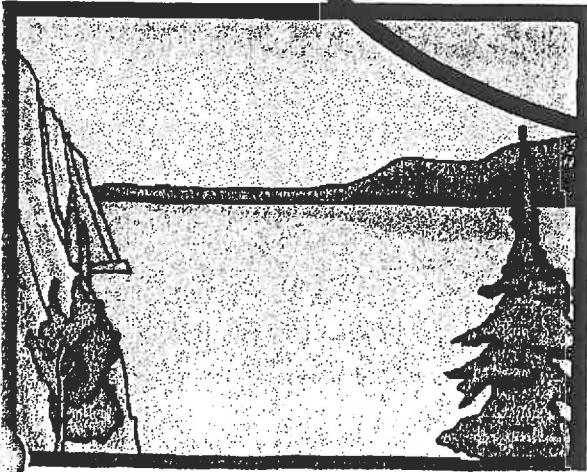
\_\_\_ Canada's Fish Resources



Name: \_\_\_\_\_



Module 7  
***Natural Resources***  
  
***And***  
  
***Industry***



## Natural Resources

Natural resources are substances that are created naturally by nature which people use. We consider natural resources valuable even in their unmodified / natural form. The dollar value of a natural resource is determined by the quantity available for extraction, how difficult it is to extract them from the earth, and the human demand for them (supply and demand).

There are 2 sorts of natural resource: renewable resources and non-renewable resources.

1. Renewable resources are natural resources that grows again or comes back again faster than society uses them
  - Ex: Trees, fish, oxygen, fresh water, soil, wind power, solar power, hydro-electric power, etc.
  - BUT...Can renewable resources become totally used up? YES! When we use them faster than they can grow / come back.
    - Ex: Plant and animal species become extinct, freshwater can be used up by over population, land/soil can erode and be used up
2. A non-renewable resource is a resource that does not grow or come back at all, or does not grow / come back as fast as we use them up.
  - Ex: a) Fossil fuels: such as coal, crude oil, natural gas
  - b) Nuclear fuels: such as uranium, thorium
  - c) Minerals: such as metallic minerals (gold, iron, copper, etc) and non-metallic minerals (asbestos, diamond, gravel, sand, etc).

## The Need for Natural Resources

Every country or place needs natural resources. When people do not have one resource where they live, they can: a) use another resource as a substitute, or b) trade with another country (for example, they can buy oil from their neighbors). Some resources are rare so, unfortunately, people sometimes fight to have them (for example, oil resources).

When people do not have some natural resources their quality of life can drop. For example, when they can not get clean water, people may become ill; if there is not enough wood, trees will be cut and the forest will disappear over time (deforestation); if there are not enough fish in a sea, people can die of starvation.

In Canada, we are fortunately a country rich in natural resources (i.e. we have many different types of natural resources, and large quantities of many of them).

## Exercises

1. Complete the following sentences:

- a. Natural resources are created \_\_\_\_\_ by nature.
- b. There are two types of natural resources. They are called \_\_\_\_\_ and \_\_\_\_\_.
- c. One factor that affects the price of natural resources is \_\_\_\_\_.

2. Check (✓) all that apply to the following terms:

a. Renewable Resources:

Trees	minerals	grow quickly	oil	Fish
-------	----------	--------------	-----	------

b. Non-renewable Resources

Limited quantities	fossil fuels	fish	solar energy	uranium
--------------------	--------------	------	--------------	---------

3. Match the first part of the sentence to the last part by writing the appropriate letter on the lines provided

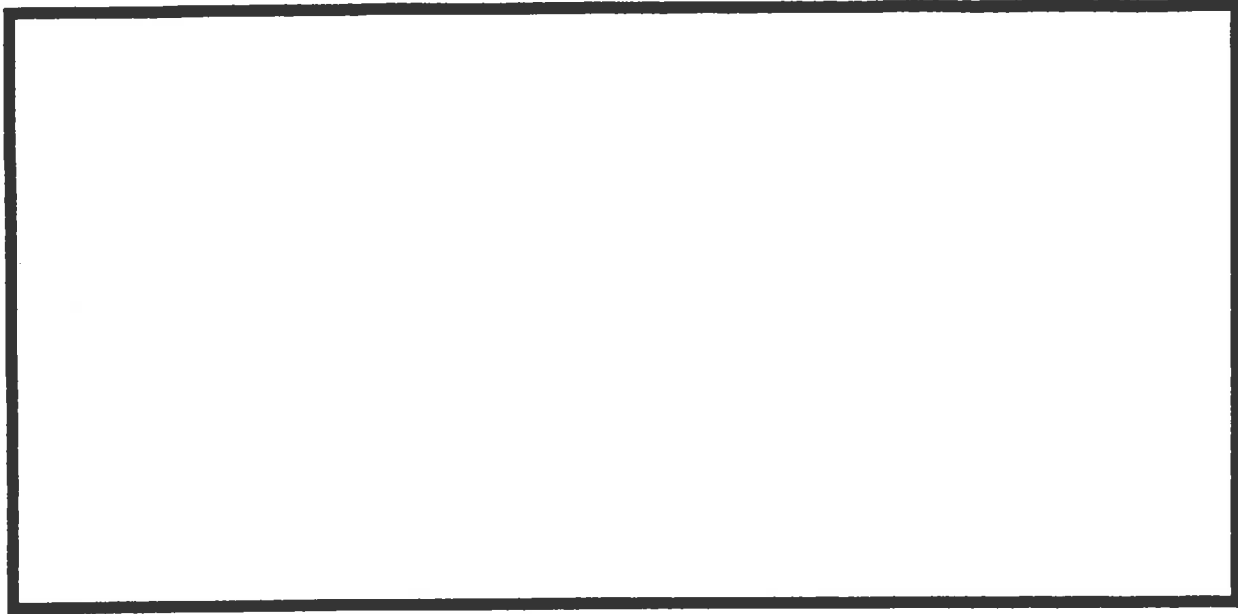
- a. Canada has lots of \_\_\_\_\_ fight
- b. Natural resources improve the \_\_\_\_\_ natural resources
- c. When resources are rare, it sometimes causes people to \_\_\_\_\_ buy / trade
- d. An example of a resource that we are using faster than can be replaced naturally is \_\_\_\_\_ quality of life
- e. If a country does not have a certain resource they can \_\_\_\_\_ oil

4. In your own words, what does 'supply and demand' mean? \_\_\_\_\_

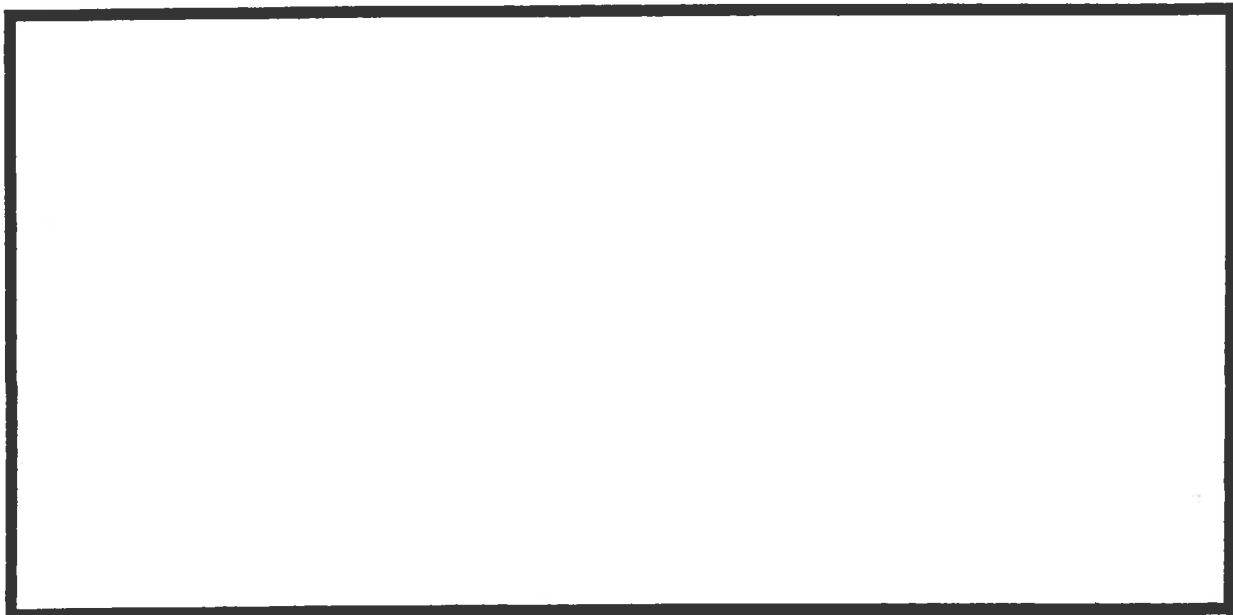
\_\_\_\_\_

\_\_\_\_\_

5. Draw 1 or more pictures of renewable resources you use regularly



6. Draw 1 or more pictures of non-renewable resources you use regularly



## Renewable and Non-Renewable Energy

The term *renewable energy* generally refers to electricity supplied from renewable energy sources, such as wind and solar power, geothermal, hydropower and various forms of biomass. These energy sources are considered renewable sources because their fuel sources are continuously replenished. *Non-renewable energy* refers to the electricity supplied from materials that cannot be replaced once we have used them. Many of the sources that supply this type of energy will eventually disappear, become too expensive, or too environmentally damaging to retrieve (such as fossil fuels like coal and oil, or nuclear products)

There are many different types of renewable energy. Renewable energy has become a more and more popular way to generate electricity. The reasons for this are the major threats of climate change due to pollution, exhaustion of fossil fuels, and the environmental, social and political risks of fossil fuels and nuclear power. Hence, renewable energy is much more environmentally friendly than non-renewable energy.

### Types of Renewable Energy

**Solar energy** = energy from the sun that is converted into electrical energy. We usually collect the sun's energy using solar panels.

**Wind energy** = electricity which comes from harvesting the power of wind using large wind turbines.

**Hydro-power** = electrical power that is made from falling or running water, usually at a hydro dam. The water is used to turn the blades of a turbine. The turbine is connected to a generator, which converts the energy from flowing water into electricity.

**Bio-energy** = electrical power generated from burning 'biomass'. Biomass includes such things as wood, wood waste, straw, manure, sugar cane, and byproducts from agricultural processes.

**Geothermal energy** = this type of energy comes from the heat from within the earth. We can use the steam and hot water produced inside the earth to heat buildings or to generate electricity.

**Tidal energy** = the electrical power made by capturing the energy from water tides and open ocean currents.

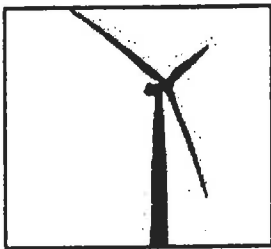
**Wave power** = the electricity made from the energy from ocean waves

# Exercises

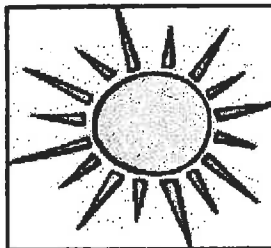
## 1. True or False

- |   |   |   |
|---|---|---|
| a. Renewable energy sources are more environmentally friendly than non-renewable energy sources | T | F |
| b. We will one day run out of the materials that we use to create non-renewable energy          | T | F |
| c. Sugarcane is an example of geothermal energy   | T | F |
| d. Hydropower comes from running or falling water   | T | F |
| e. Tidal and wave power both come from the ocean  | T | F |
| f. Solar panels are used to collect energy from wind  | T | F |
| g. Fossil fuels are an example of a renewable energy source                                     | T | F |

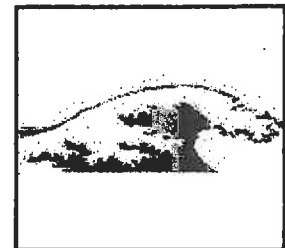
## 2. Using the word-bank below, label each picture:



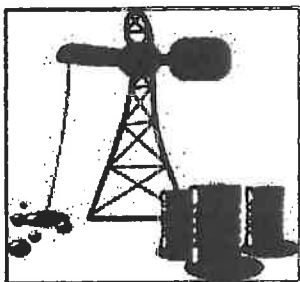
a \_\_\_\_\_



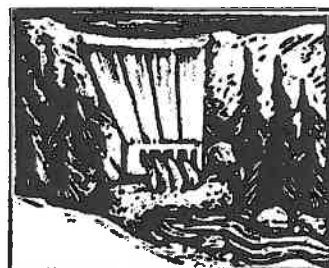
b \_\_\_\_\_



c \_\_\_\_\_



d \_\_\_\_\_



e \_\_\_\_\_

Solar Power	Wave Power	Hydro-power
Wind Power	Non-renewable Energy	



## Jobs and Natural Resources

Canada's natural resource sectors - our forests, energy, and minerals and metals are a vital part of Canada's economy and society. The natural resource sectors and related industries are very important for creating jobs. Natural resources not only create many jobs for Canadians, but make us money when we sell them to other countries (called *exporting*).

### Types of Industry

There are 4 types of industries:

1. **Primary industries** = these are the industries that take/extract raw materials from the environment. They are called *primary* because the extraction of natural resources must happen before anything else, such as manufacturing, can occur.
  - Ex: agriculture, fishing and trapping, mining, fuel and energy industries, and logging
2. **Secondary industries** = industries that involve the processing of raw materials and the manufacturing of products using natural resources.
  - Ex: iron mill, auto parts plant, furniture manufacturer
3. **Tertiary industries** = the industries that involve providing services and includes the delivery of products to the market. Hence, jobs in this industry are often called the 'service industry'.
  - Ex: banking, teachers, sales people, truck drivers
4. **Quaternary industries** = jobs in this sector involve dealing with ideas rather than processing products
  - Ex: computer programmers, accountants, professors, novel writers

## Exercises

### 1. Circle the letter of the best answer

A. Selling and shipping natural resources from Canada to other countries is called:

- a. importing
- b. exporting

B. Natural resources create many \_\_\_\_\_ for Canadians

- a. jobs
- b. sectors

C. This industry does not deal with natural resources, but rather ideas

- a. quaternary
- b. primary

D. A bus driver would belong to this industry

- a. Tertiary
- b. Secondary

E. A lobster fisherman would belong to this industry

- a. Primary
- b. Secondary

2. Think of someone close to you. What is their profession? \_\_\_\_\_

What industry does this job belong to? \_\_\_\_\_

3. What do you want to do as a career when you graduate? \_\_\_\_\_

What industry does this job belong to? \_\_\_\_\_

4. Why do the activities of the primary industry have to happen before the activities involved in the secondary and tertiary industries? \_\_\_\_\_

---

Name: \_\_\_\_\_

# Canada's Forest Resources



## What is forestry?

Forestry is the practice of managing forest resources, such as trees, to meet the long-term needs of humans. Humans require wood for many purposes, such as building supplies. But, we can't just cut down all the trees we like...this would destroy forest ecosystems and animal habitat, and leave less and less trees for future generations. To avoid these consequences, loggers perform 'sustainable management' which simply means not cutting down more trees than we need, and avoiding logging in areas that would cause too much environmental damage.

### Forest Facts

Forests cover almost half (42%) of Canada's total area! That means that there are 4 187 820 square kilometers of forests in Canada. Canada has many different types of trees in our forests. More than 63% of the forests in Canada are made up of *coniferous* (con-ni-fer-us) trees - the trees that have needles and cones like Christmas trees. Examples of coniferous trees are pine and spruce. About 22% of Canada's forests are made of *deciduous* (dee-sid-u-us) trees - trees that have flat leaves. Deciduous trees lose their leaves in the winter time. Examples of deciduous trees are oak, poplar, and birch. The remaining 15% of the forests in Canada are made up of a *mixture* of coniferous trees and deciduous trees, therefore, they are called 'mixed forests'.



Coniferous Tree



Deciduous tree

### Commercial and Non-Commercial Forests

*Commercial forests* are those that have trees that we can cut down and earn a profit for. These forests are in warmer, wetter areas of Canada so the trees grow fairly quickly. Also they are found close to roads or railways, making it easier to ship them. *Non-commercial forests* are generally those that are unlikely to be cut down because they are located too far north. It is too cold in the north for trees to grow big or fast, and they are too far away from roads / railways to transport them.

# Exercises

Answer the following questions:

1. What is forestry? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. What percent (%) of Canada is covered by forests? \_\_\_\_\_  
What is this in square kilometers (km<sup>2</sup>)? \_\_\_\_\_
3. Canadians use wood for many different purposes and products. Can you think of some ways that we use wood? \_\_\_\_\_, and \_\_\_\_\_, and \_\_\_\_\_
4. What type of tree is the most common in Canada's forests? \_\_\_\_\_
5. List 2 examples of coniferous trees and 2 examples of deciduous trees (Can you think of your own examples?)  
\_\_\_\_\_  
\_\_\_\_\_
6. Refer to question #4 - does this answer surprise you? \_\_\_\_\_ Why/why not?  
\_\_\_\_\_  
\_\_\_\_\_
7. What type of trees loose their leaves in the winter time? \_\_\_\_\_
8. Why are 'non-commercial forests' logged less than 'commercial forests'? (2 reasons) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. What are the consequences of cutting down too many trees? (list 2) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
10. What types of trees are in a 'mixed forest'? \_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_

## Canada's 5 Forest Regions

### 1. Boreal Forest Region

- Canada's biggest forest
- Made up mostly of coniferous trees such as black spruce, fir, jack pine, and cedar
- The wood cut from these forests are mainly used to make paper, and for building lumber



### 2. Taiga Forest Region

- This forest is located far in the north where it's quite cold. Therefore, the trees here are quite small and don't grow very much.
- Only some parts are logged due to inaccessibility and distance from roads
- Mostly coniferous trees



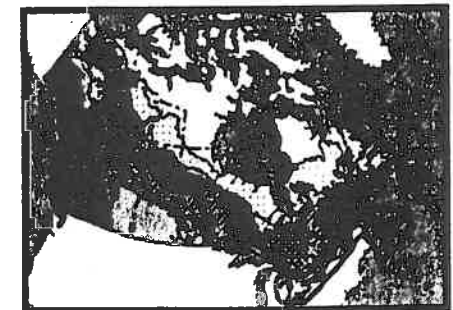
### 3 & 4. West Coast & Montane Forest Regions

- Located near the Pacific Ocean
- Has the most trees per area in Canada (= the most dense forest) because of the high rain fall and warm weather
- Mostly coniferous trees



### 5. Mixed Forest Region

- Made up of both coniferous and deciduous trees
- Trees are cut down mostly for paper and building lumber
- The sugar maple trees in this forest is where we get maple syrup from



## Exercises

Answer the following questions on forest location. You may need to look at the classroom maps.

1. The boreal forest covers 1 territory and 8 provinces. What are they?
 

a.	b.
c.	d.
e.	f.
g.	h.
i.	
  
2. Which of Canada's forest regions is located the furthest north? \_\_\_\_\_
  
3. Toronto, Canada is located nearest which forest region? \_\_\_\_\_
  
4. The West Coast & Montane Forest Regions are located in British Columbia. Why does this region have the densest forests? \_\_\_\_\_  
\_\_\_\_\_
  
5. List 2 forest regions whose trees are used to make paper: \_\_\_\_\_  
and \_\_\_\_\_

### Circle True or False

1. The boreal forest is made up mostly of deciduous trees	T	F
2. Trees don't grow well in the taiga forest region because it's too cold	T	F
3. The wood from the boreal forest is used mainly to make pencils	T	F
4. It is difficult to get to areas in the taiga region because there are no roads	T	F
5. It rains a lot in the West Coast & Montane Forest Regions because they are close to the Pacific Ocean	T	F
6. Maple syrup comes from the taiga forest region	T	F
7. There are less trees on the prairies than in the 5 forest regions of Canada	T	F
8. The mixed forest region is likely to receive acid rain	T	F
9. The mixed forest region is Canada's biggest forest	T	F
10. The West Coast & Montane Forest Regions span 5 provinces	T	F

## Canada's Forest Industries:



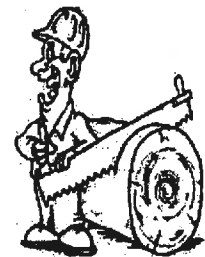
### There are several forest industries in Canada:

1. Lumber industry - the companies who harvest wood from the forests, process the wood (de-bark it, cut it to pieces, make 2x4's, etc.), and sell the wood to other companies.
2. Pulp and paper industry - the companies convert wood to pulp and/or paper and sell their products to other companies. Pulp is a mixture of water and pulverized wood used in the production of paper, cardboard, fiberboard, rayon, cellophane, and other products. Paper is also made from wood by drying out wood pulp in long sheets.
3. 'Other forest products' - This catch-all sector includes the type of companies that are involved in manufacturing products from wood. These companies might make products such as veneers, plywood, or engineered wood products. This sector can also include companies who make a diverse range of wood products, such as doors, windows, and furniture.

## Forestry, the Economy, and Jobs

Forests play an important role in the economic (\$) lives of Canadians. Approximately 1 out of every 16 people in Canada has a job that depends on forestry, whether they are cutting down trees or simply processing paperwork dealing with forestry. The forest industry produces about \$80 billion of profit for Canada per year! More than half of this money comes from selling our forest products to other countries (exporting it).

The forestry industry supplies more than 360 000 'direct' jobs for Canadians. (A direct job = means that the people are actually cutting or processing trees or involved in manufacturing). However, another 500 000 jobs are 'indirectly' created to support the forestry industry. (An indirect job = means those workers that support the forestry industry, but do not directly work in forests or manufacturing plants). These 'indirect' jobs can range from supplying machinery to the foresters, organizing the distribution of wood products, creating forest management plans, or even the accountant who calculates the workers' paychecks.



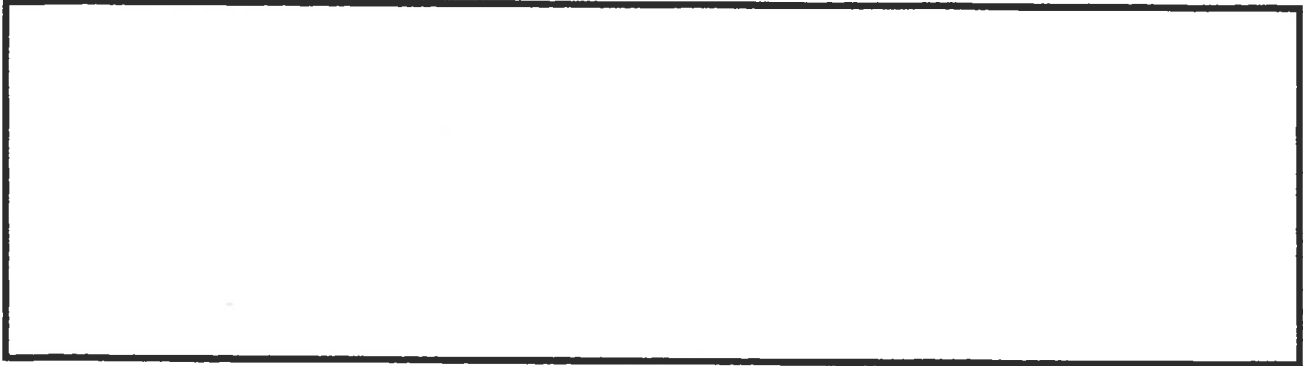


# Exercises

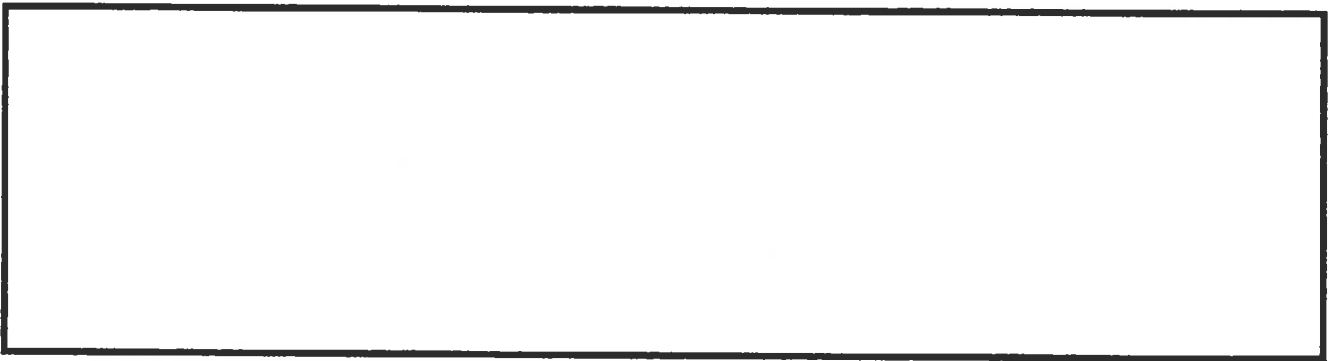
Circle the best answer:

1. The lumber industry:
  - a. Harvests wood
  - b. Makes furniture
2. Lumber can be used to make:
  - a. Wood products
  - b. Plastic products
3. Paper comes from
  - a. The ground
  - b. Trees
4. Pulp is a mixture of wood particles and:
  - a. Soil
  - b. Water
5. A cabinet maker would belong to which industry?
  - a. The 'other forest products' sector
  - b. The lumber industry
6. 1 in \_\_\_\_\_ Canadians has a job relating to forestry
  - a. 16
  - b. 61
7. Harvesting our forest resources \_\_\_\_\_ our economy:
  - a. Hinders
  - b. Helps
8. A forester who operates a chainsaw and cuts down trees would have a(n)
  - a. 'direct' forestry job
  - b. 'indirect' forestry job
9. A person who sells hardwood flooring would have a(n)
  - a. 'direct' forestry job
  - b. 'indirect' forestry job
10. Most of the \$80 million in profit comes from
  - a. Making paper
  - b. Exporting wood products
11. There are \_\_\_\_\_ directly related forestry jobs than indirectly related forestry jobs
  - a. More
  - b. Less
12. Canada has plenty of wood as a natural resource
  - a. True
  - b. False
13. Many people would likely lose their jobs if we did not manage our forests properly
  - a. True
  - b. False

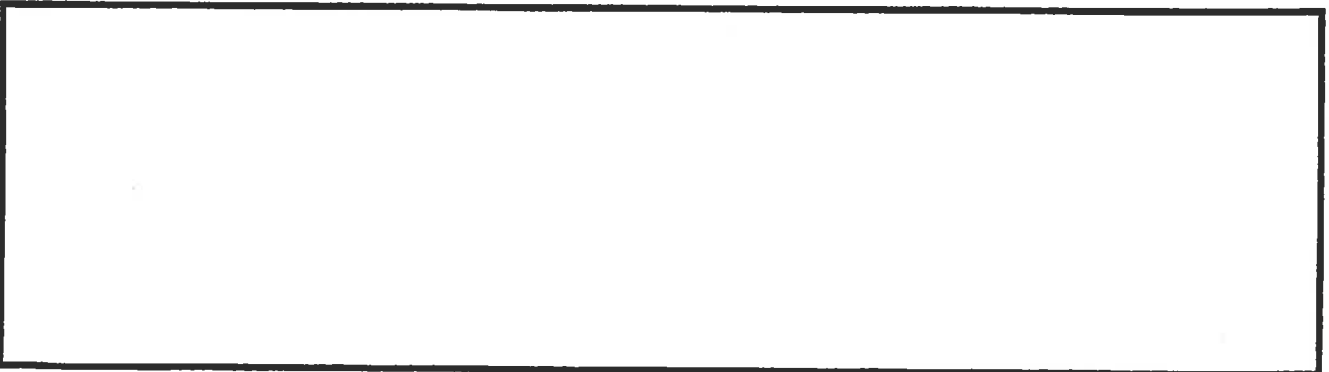
The lumber industry harvests wood from the forests so that we can make products from it. Draw a **finished product** of something that would use the wood purchased from the lumber industry (remember they make things like wood planks and beams):



The pulp and paper industry makes paper from wood. Everyday we use things that are made from paper. Draw a **finished product** of at least 1 thing that you use / read that is made from paper:



The last group of industries makes different kinds of finished products from wood, such as plywood, furniture, doors, and windows. Draw at least 1 picture of a finished product that would be made from this industry.



## Threats to the Forests

Forests provide a crucial natural, renewable resource for humans, however there are some threats that can seriously damage our forests

### 1. Environmental Hazards

There are three important environmental hazards that pose risks to our forests. The first is acid rain. Acid rain is caused when gasses and chemicals that we release into the atmosphere become incorporated in raindrops. When the rain falls on forests, it is poisonous to the trees. Acid rain is more common around large cities that emit many harmful gasses into the atmosphere from vehicles and industrial areas. Acid rain is a growing problem in Quebec as well as in Eastern Canada. The second and third environmental hazards are insect pests and tree diseases. Some harmful insects include tent caterpillars and the pine bark beetles. Insects often damage parts of the tree, making them more prone to disease, and resulting in dead or unhealthy trees.



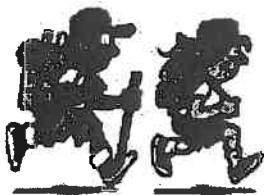
### 2. Forest Fires

Fires are a natural part of the lifecycle of forests. In fact, fires can be healthy to forests because it clears out all the old and dead trees, and encourages the growth of new healthy trees. Some trees, like the jack pine, actually require intense heat from fires to 'unlock' the seeds from their pine-cones. However, fires can become a problem when they occur in forests that are valuable for timber (wood). Every year approximately 9500 fires burn 30 000 square kilometers of Canada's forests. Almost half of all fires are caused by lightning. The other half of fires are caused by humans.



### 'Smart' Forestry

'Sustainable development' is a way for people to use resources, such as trees, without the resources running out. This means that we cannot be greedy and take all the trees we want from our forests. Forestry involves lots of planning from year to year so that we know how many trees we can cut, how many trees will grow, and how the threats to the forests will also play a role. Managing our forests wisely is also important because we use our forests for recreation (= fun activities) such as camping, hiking, canoeing, and fishing.



# Exercises

1. What are the 4 main threats to our forests?

---

---

2. What is unique about the jack pine tree? \_\_\_\_\_

---

3. Why is fire sometimes a good thing for forests? \_\_\_\_\_

---

---

4. When is fire a bad thing for forests (and humans)? \_\_\_\_\_

---

---

5. What is your favorite thing to do in forests? \_\_\_\_\_

---

---

6. What is one way that we can reduce acid rain? \_\_\_\_\_

---

7. Sometimes forest officials perform 'controlled burns' which is setting fires on purpose, but closely monitoring and controlling the fire. These burns simulate the natural occurrence of forest fires in order to clear out dead old trees. Can you think of any risks of performing controlled burns? \_\_\_\_\_

---

---

---

8. Forests are home to many wildlife as well as different kinds of trees and plants. Can you name a few that we find in Canada? \_\_\_\_\_

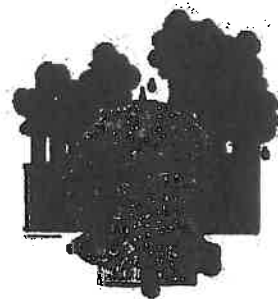
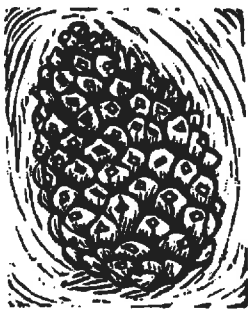
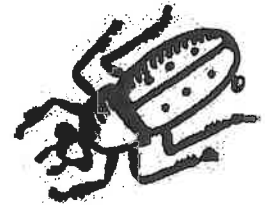
---

---

Match the first part of the sentence to the last part by writing the appropriate letter on the lines provided

1. When harmful chemicals become incorporated in rain drops, it's called: \_\_\_\_\_ sustainable development
2. Insects can damage trees, making them more prone to \_\_\_\_\_ humans
3. When we manage renewable resources so that we use them but don't run out of them, it's called \_\_\_\_\_ wood
4. About half of the fires in Canada are caused by lightning, and about half are caused by \_\_\_\_\_ recreation
5. Forests are good not only for natural resources, but also for \_\_\_\_\_ disease
6. Timber and lumber are words meaning \_\_\_\_\_ acid rain

Match the following images to the terms below:

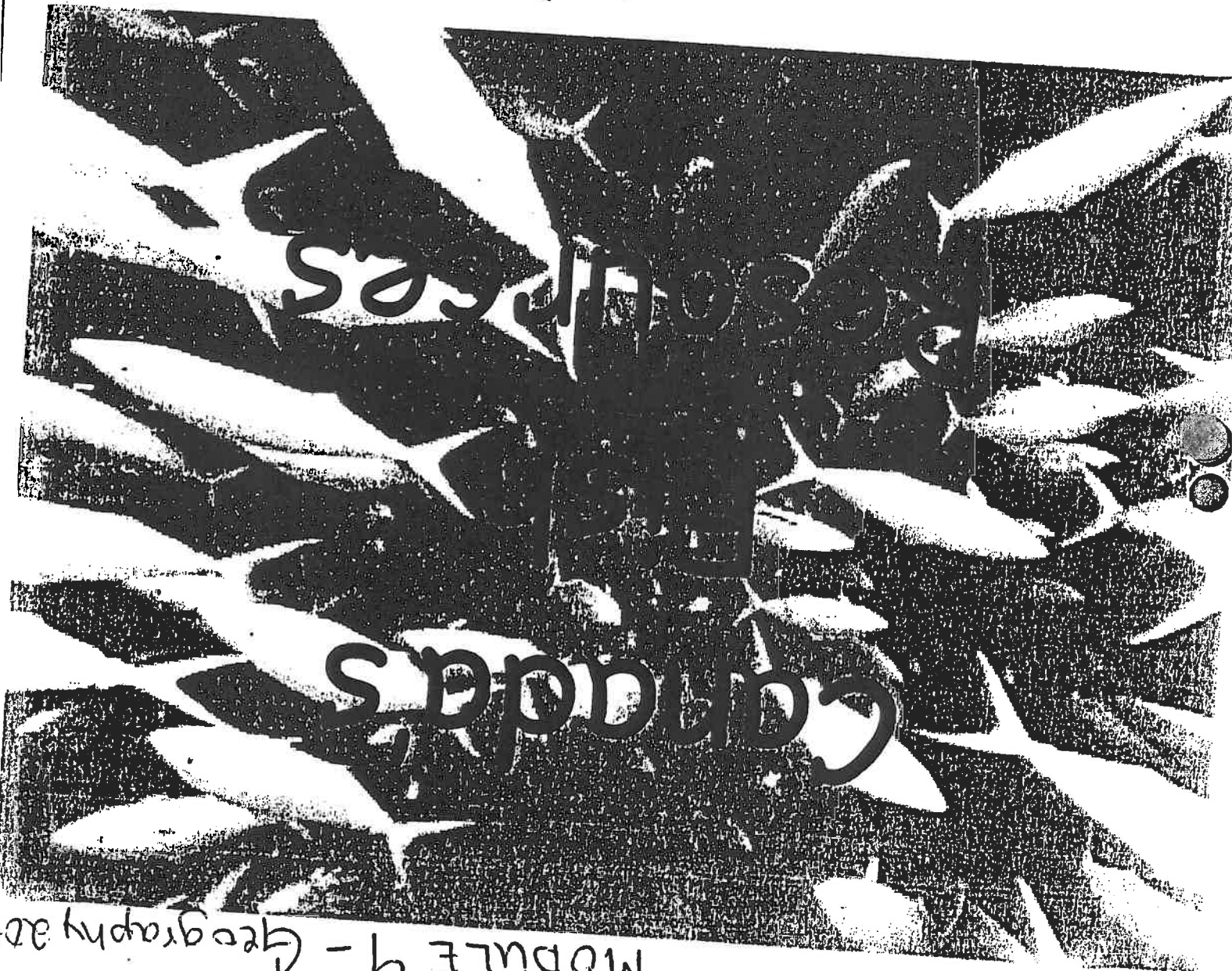
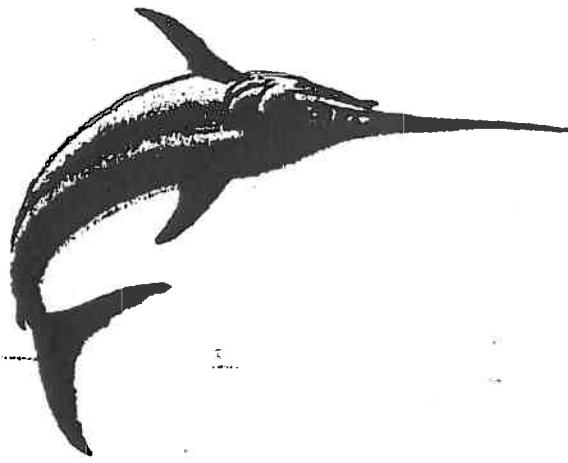


Lightning  
Pest

Recreation  
Pine-cone

Acid Rain  
Forest Fire





MODULE 9 - Geography 201



me: \_\_\_\_\_  
Date: \_\_\_\_\_

## Fast Fishing Facts:

- Fish are a renewable resource unless they are 'over-fished' (fished too much)
- Ocean fishing is Canada's oldest industry
- Beginning in the 1500's, many Europeans set up summer fishing stations on the east coast of Canada. Some of these stations still exist today because they grew into cities.
- Commercial fishing = fishing that is done for a profit, so the fish are sold rather than kept for personal use / consumption.
- Commercial fishing occurs in 3 main areas: the East Coast, the West Coast and in some freshwater inland lakes.
- Canada is one of the world's leading fish exporters. One reason for this is that Canadians don't eat much fish. The United States is one of our biggest customers. Others include Western Europe, and Japan.

## There Are 3 Categories of Fish Caught in Canada's Oceans:

### 1. Groundfish

- These are the fish that feed and are caught near the ocean floor
- Ex: cod, pollock, haddock, halibut, redfish



### 2. Pelagic Fish

- These are the fish that are found in the open water. They feed and are caught near the ocean
- Ex: salmon, herring, mackerel, tuna

### 3. Shellfish

- These are aquatic creatures with shells
- Ex: shrimp, lobster, oyster, crab, scallops





## Canada's East Coast Fishery:

Until recently, the oceanic waters off the coast of Canada's East Coast were one of the world's best fishing grounds. There were several favorable conditions on the East Coast that produced very good fish:

- a. **The continental shelf:** A continental shelf is the gently sloping portion of a coastline that is under water. The Atlantic continental shelf is fairly shallow. This allows sunlight to penetrate the water right to the bottom which grows plankton (= fish food) and attracts a large amount of fish.
- b. **The oceanic currents:** On the East Coast, two currents - 1 warm and 1 cold, meet each other. When they meet, it stirs up nutrients that have settled to the ocean floor, creating even more food for plankton and fish.

## Collapse of the East Coast Fishery:

*A 'collapse' of a fishery means that a certain type of fish has been over-fished to the point that population numbers plummet drastically and it is no longer safe to catch that particular type of fish because they are at risk of extinction.*



In the 1980's, people employed in the East Coast fishing industry relied on groundfish, especially northern cod, as their source of income. But, they began to notice that they were catching fewer and smaller fish. Particularly, the northern cod fish off the coast of Newfoundland and Labrador seemed to be disappearing. Finally in 1991 the cod fishery collapsed. One fishing village reported catching only 3 cod in 1992! By 1992 the government completely banned all fishing of northern cod, and drastically reduced the quota (=the number of fish allowed to be caught) for many other groundfish species.

## So Why Did the East Coast Fishery Collapse?

While no single cause is solely responsible, several reasons have been proposed to explain the collapse of the East Coast fishery.

1. **Overfishing.** Each year, the federal government set the number of fish allowed to be caught too high. Each year, more fish were being removed from the ocean than were reaching the age of maturity. When fish are caught before the age of

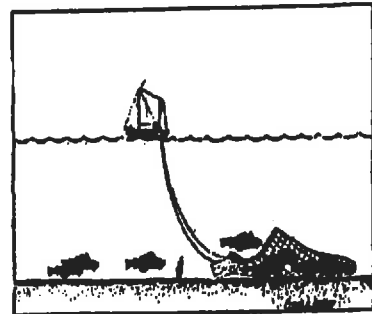
...urity, they do not get a chance to reproduce which is important for replenishing the oceans with fish.

2. **Improved Fishing Technology.** Following World War II, larger, more powerful boats were developed which were then used for fishing. Other technology was also developed such as fish-finders and sonar. Hence, while finding schools of fish in the past was based on skill and guesswork, these technologies made finding masses of fish easy...too easy.



3. **Uncontrolled Foreign Fishing.** Foreign fishing boats (boats from countries other than Canada) at that time were traveling far distances and doing massive amounts of fishing in the waters off Canada. As a result, in 1977, Canada was finally granted permission to extend our political control from the shore line to 370 km out to sea to protect our fish stocks. This decision, however, was not made soon enough and the fish populations had already declined drastically.

4. **Destructive Fishing Practices.** Big fishing boats, called trawlers, often only fish for one type of fish at a time. However, they tend to catch other types of fish (such as northern cod) than the one targeted...these fish are called bycatch. The 'bycatch' fish die and are thrown back into the ocean, BUT they are not reported to the government as being caught. This dwindles their populations 'unknowingly'.



5. **Changes in Natural Conditions.** One last factor that may have also contributed to the collapse of the East Coast fishery was oceanic changes. Since the mid 1980s, temperatures have dropped and salt levels have changed in the waters surrounding Eastern Canada. This may have changed the migratory patterns of some fish to avoid these areas.

Please answer the following questions.

1. What about the continental shelf made ideal conditions for fish? \_\_\_\_\_  
\_\_\_\_\_

2. What happens when a warm current meets a cool current? Why is this good for fish? \_\_\_\_\_  
\_\_\_\_\_

3. What is a fishery collapse? \_\_\_\_\_  
\_\_\_\_\_

4. What are some of the reasons why humans were responsible for the collapse of the East Coast fishery? \_\_\_\_\_  
\_\_\_\_\_

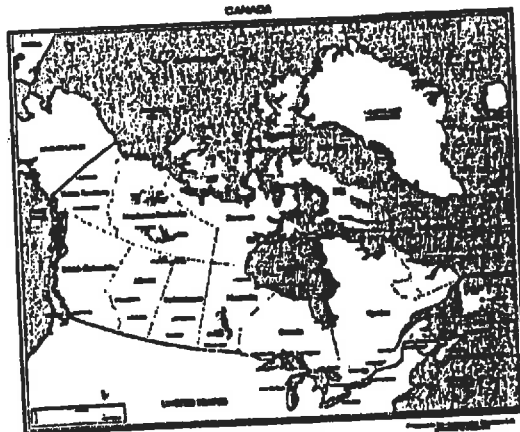
5. Does it surprise you that humans can have such an impact on the numbers of fish in the ocean? Why? \_\_\_\_\_  
\_\_\_\_\_

Matching - using the word bank below, write the letter of the appropriate answer beside each phrase/sentence

- 6. better boats, fish finders, less 'guess work' \_\_\_\_\_
- 7. boats from other countries fishing in Canadian waters \_\_\_\_\_
- 8. a change in the water temperature and salt levels \_\_\_\_\_
- 9. catching 'undesired' fish by accident, throwing them overboard, but not accounting for them \_\_\_\_\_
- 10. overestimating the number of fish available in nature and fishing too much \_\_\_\_\_

A. Uncontrolled foreign fishing	B. Destructive fishing practices	C. Improved fishing technology	D. Changes in natural conditions	E. Overfishing
---------------------------------	----------------------------------	--------------------------------	----------------------------------	----------------

Answer the following questions:



1. Here is a map of Canada including lakes, rivers, and the oceanic coasts. Circle 3 areas where commercial fishing would occur - 1 of which must be a freshwater location.

2. Why are fish a renewable resource? \_\_\_\_\_

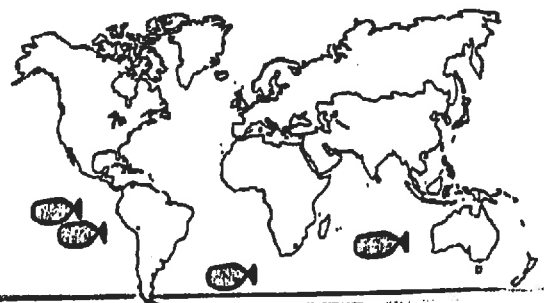
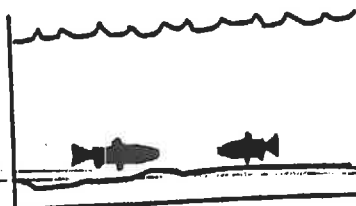
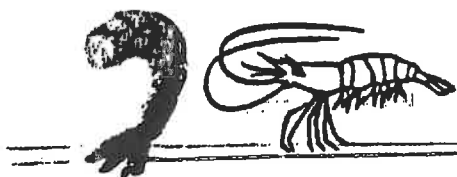
3. Name the 3 types of ocean fish that are caught, and give 2 examples for each:

- a.
- b.
- c.

4. Which types of fish have you eaten? \_\_\_\_\_

5. Why do you think people in other countries eat so much more seafood than Canadians? \_\_\_\_\_

Label the following pictures using the words provided below:



Groundfish      Shellfish      Pelagic Fish

## Canada's West Coast Fishery

The most important fish for the fishing industry on the West Coast is salmon. There are 5 types of salmon: coho, chum, pink, chinook, and the most valuable of all, sockeye. Every summer/fall, salmon fish make the migration from the open Pacific



Ocean to freshwater streams in B.C. where they lay their eggs. It is here, at the junction of the ocean and freshwater streams, where fishing boats wait to catch the salmon. In 1994, approximately 1 million fewer salmon arrived to the freshwater streams than scientists had estimated and the West Coast Fishery also collapsed.

### So Why Did the West Coast Fishery Collapse?

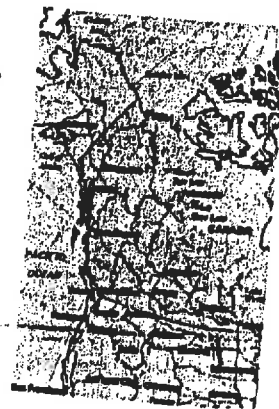
The main reason for the collapse was poor estimates of how many fish were available in the oceans which led to overfishing.

1. **Overfishing.** Every year over 800 000 tones of salmon were caught each year between Alaska, B.C., and California. Too many fish were being caught, and not enough reaching the age to reproduce to replenish the fish population.



2. **Changes in the Environment.** Global warming seems to be warming the Pacific Ocean. This is bad news for salmon who prefer waters cooler than 7°C. Hence, some salmon may have moved northward, beyond the Canadian fishing range, seeking cooler waters.

3. **Lack of a Salmon Treaty.** Canada and the United States have long disagreed about where salmon should be caught and how many can be caught. Canadian officials claim that fewer salmon should be caught in order to preserve the fish populations, however the United States, particularly Alaska, claim that there are plenty of salmon, so fishing restrictions are not needed. As long as there is a disagreement on acceptable fishing limits/ranges between Canada and the USA, salmon populations are at risk.



Please answer the following questions.

1. Why do salmon migrate from the oceans into freshwater streams? \_\_\_\_\_  
\_\_\_\_\_
2. Scientists extremely under-estimated the number of salmon returning to BC by approximately 1 million fish. What reasons could there be to explain this? \_\_\_\_\_  
\_\_\_\_\_
3. What kind of impact do you think this had on the fishermen who were anticipating way more fish that season? \_\_\_\_\_  
\_\_\_\_\_
4. Why is it important that Canada and the USA agree on proper fishing techniques? \_\_\_\_\_  
\_\_\_\_\_
5. Where do the fishing boats wait for the salmon to arrive? \_\_\_\_\_  
\_\_\_\_\_

True or False - Circle T or F

6. Salmon is the most important fish on the West Coast	T	F
7. Groundfish are the most important fish on the East Coast	T	F
8. Overfishing is mainly to blame for the collapse of both the East Coast and West Coast fisheries	T	F
9. A decrease in temperature in the waters surrounding BC may have led to a change in the salmon's habitat	T	F
10. Canada is not concerned about the number of salmon remaining in nature	T	F
11. Even immature fish can reproduce	T	F
12. 1 million fewer fish returned to the freshwater streams because they had been overfished in previous years	T	F
13. Humans value the coho salmon the most	T	F
14. Salmon travel from saltwater into freshwater	T	F
15. Canada was harvesting over 1 million tons of salmon each year	T	F

## Freshwater Fisheries

Canada's freshwater fisheries occur in inland lakes and rivers. The main industries are located in the Great Lakes (Huron, Ontario, Michigan, Erie, Superior), Great Slave Lake in the NWT, and Lake Winnipeg. The major species caught and sent to market from these lakes are whitefish, perch, pickerel, and trout.



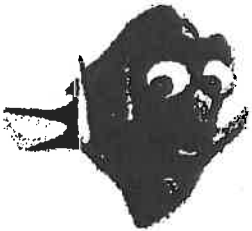
## Sport Fishing & Recreation

For most people, going fishing is simply a pleasant way to spend a summer day. They do not realize that 'sport fishing' is a major industry and money maker for Canada. Many people come from different countries to fish in Canada for pleasure, and while they vacation here, they feed our economy. This is because not only are they purchasing fishing supplies, bait, and so on, but they are also paying for food, lodging, gas, boats, etc. Two thirds (2/3) of our international visitors who come here to fish do so in Ontario.



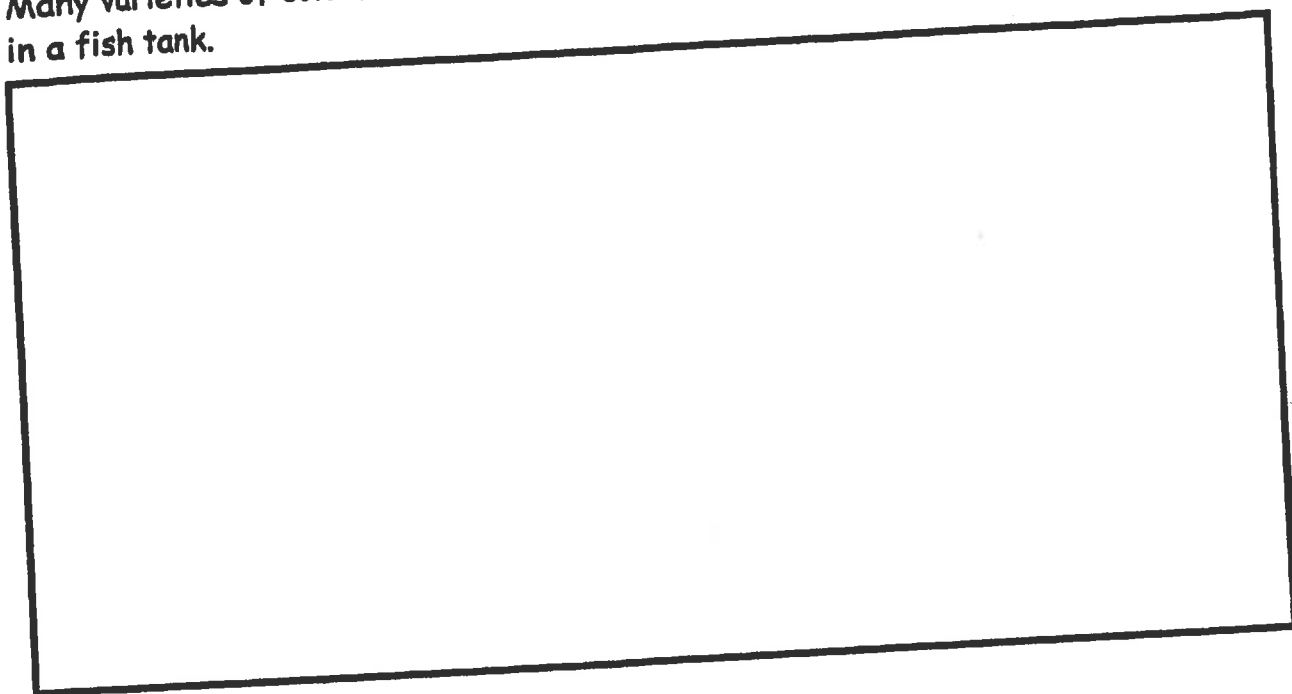
## Global problem = Global Solutions??

Canada is not alone in the fishery crisis. Many other nations have experienced a complete collapse of certain fish populations. There is a global trend of depleting numbers of fish which began in 1970s. The World Wildlife Fund reports that 70% of the world's most valuable fish populations are depleted / overfished. So what can we do? Well, it's important to remember that fish ARE natural resources, therefore, if we fish carefully they will replenish themselves and we will have fish left for future generations. This may mean stopping all fishing efforts for certain species of fish to let their population numbers bounce back. Unfortunately, some types of fish populations have been fished to the point that scientists are unsure if their population numbers will ever come back to what they once were. Before we overfish the remaining species of valuable fish, it is important to learn from our mistakes and make an honest effort to preserve what is still available in nature. This may mean passing laws to do so.

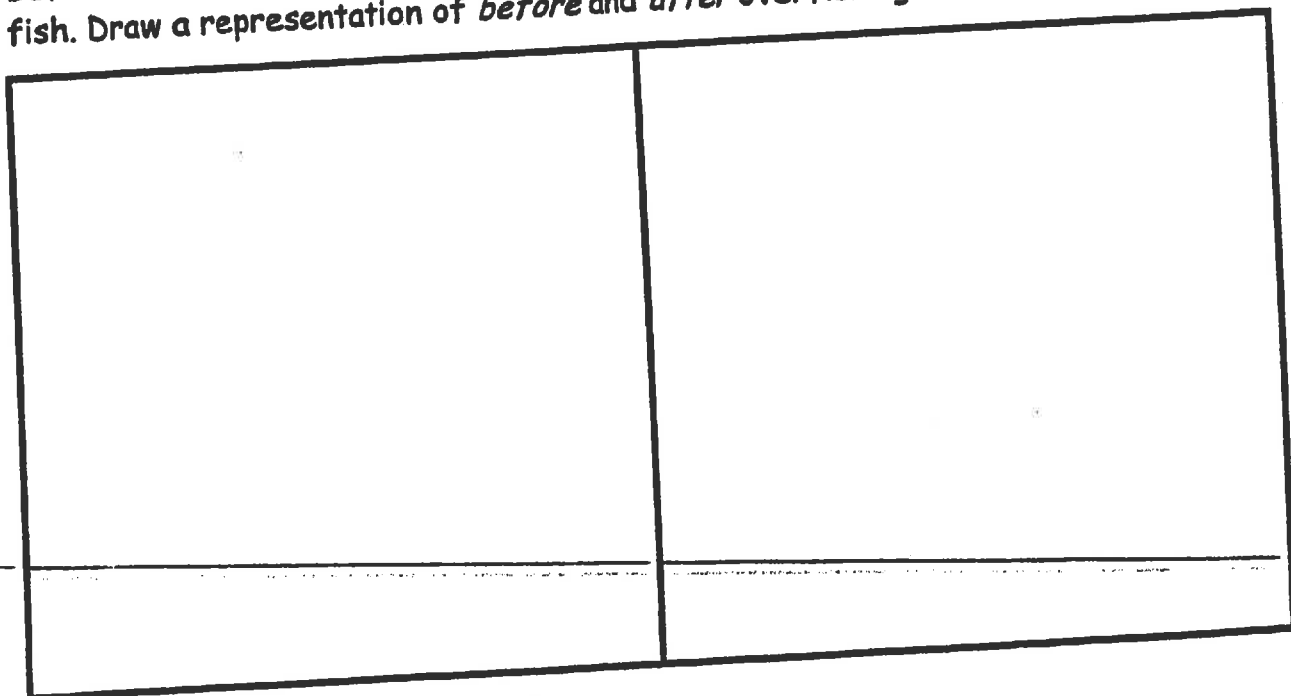


**Art Box:**

Many varieties of colorful fish are also found in our oceans. Draw a picture of fish in a fish tank.



Before humans overfished certain species, the oceans were much more plentiful of fish. Draw a representation of *before* and *after* overfishing occurred.





1. Fish are not only an important resource for humans but are also essential to ecosystems within the oceans and freshwater. What do you think might happen to the food chain if we over-fished a certain type of fish? \_\_\_\_\_

2. Why is sport fishing so good for Canada's economy? \_\_\_\_\_

3. Examine a map of Canada. Why do you suppose that Great Lakes, Great Slave Lake, and Lake Winnipeg are the main locations for freshwater fisheries? \_\_\_\_\_

4. Most sport fishing occurs in which province? \_\_\_\_\_

5. What is one strategy we can do to help recover the fish populations that we have overfished? \_\_\_\_\_

**Multiple Choice:**

6. An example of a freshwater fish is  
a. pickerel  
b. salmon

7. An example of a saltwater fish is  
a. cod  
b. trout

8. More than \_\_\_\_\_ of the world's most valuable fish populations have been overfished or depleted somehow.  
a. 10%  
b. 70%

9. Some fish populations have been depleted so much, scientists are unsure if their population numbers will ever go back to normal  
a. true  
b. false

10. Sometimes the only way to get people to stop overfishing is to  
a. ask politely  
b. pass a law



Name: \_\_\_\_\_

Canada's

Forest

Resources



## What is forestry?

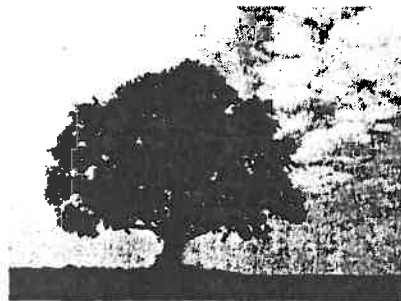
Forestry is the practice of managing forest resources, such as trees, to meet the long-term needs of humans. Humans require wood for many purposes, such as building supplies. But, we can't just cut down all the trees we like...this would destroy forest ecosystems and animal habitat, and leave less and less trees for future generations. To avoid these consequences, loggers perform 'sustainable management' which simply means not cutting down more trees than we need, and avoiding logging in areas that would cause too much environmental damage.

### Forest Facts

Forests cover almost half (42%) of Canada's total area! That means that there are 4 187 820 square kilometers of forests in Canada. Canada has many different types of trees in our forests. More than 63% of the forests in Canada are made up of *coniferous* (con-ni-fer-us) trees - the trees that have needles and cones like Christmas trees. Examples of coniferous trees are pine and spruce. About 22% of Canada's forests are made of *deciduous* (dee-sid-u-us) trees - trees that have flat leaves. Deciduous trees lose their leaves in the winter time. Examples of deciduous trees are oak, poplar, and birch. The remaining 15% of the forests in Canada are made up of a *mixture* of coniferous trees and deciduous trees, therefore, they are called 'mixed forests'.



Coniferous Tree



Deciduous tree

### Commercial and Non-Commercial Forests

*Commercial forests* are those that have trees that we can cut down and earn a profit for. These forests are in warmer, wetter areas of Canada so the trees grow fairly quickly. Also they are found close to roads or railways, making it easier to ship them. *Non-commercial forests* are generally those that are unlikely to be cut down because they are located too far north. It is too cold in the north for trees to grow big or fast, and they are too far away from roads / railways to transport them.

# Exercises

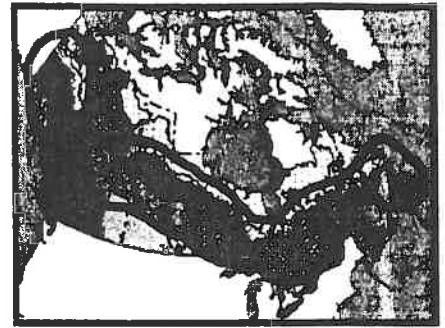
Answer the following questions:

1. What is forestry? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. What percent (%) of Canada is covered by forests? \_\_\_\_\_  
What is this in square kilometers (km<sup>2</sup>)? \_\_\_\_\_
3. Canadians use wood for many different purposes and products. Can you think of some ways that we use wood? \_\_\_\_\_, and \_\_\_\_\_, and \_\_\_\_\_
4. What type of tree is the most common in Canada's forests? \_\_\_\_\_
5. List 2 examples of coniferous trees and 2 examples of deciduous trees (Can you think of your own examples?)  
\_\_\_\_\_  
\_\_\_\_\_
6. Refer to question #4 - does this answer surprise you? \_\_\_\_\_ Why/why not?  
\_\_\_\_\_  
\_\_\_\_\_
7. What type of trees loose their leaves in the winter time? \_\_\_\_\_
8. Why are 'non-commercial forests' logged less than 'commercial forests'? (2 reasons) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. What are the consequences of cutting down too many trees? (list 2) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
10. What types of trees are in a 'mixed forest'? \_\_\_\_\_ and \_\_\_\_\_  
\_\_\_\_\_

## Canada's 5 Forest Regions

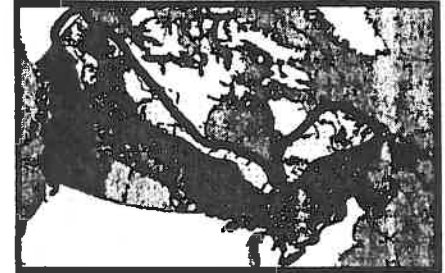
### 1. Boreal Forest Region

- Canada's biggest forest
- Made up mostly of coniferous trees such as black spruce, fir, jack pine, and cedar
- The wood cut from these forests are mainly used to make paper, and for building lumber



### 2. Taiga Forest Region

- This forest is located far in the north where it's quite cold. Therefore, the trees here are quite small and don't grow very much.
- Only some parts are logged due to inaccessibility and distance from roads
- Mostly coniferous trees



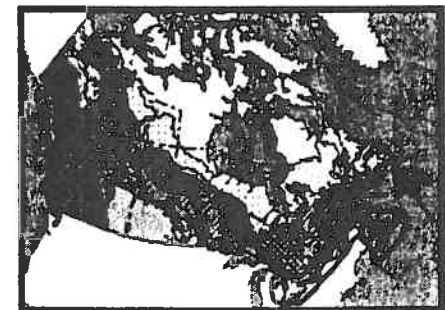
### 3 & 4. West Coast & Montane Forest Regions

- Located near the Pacific Ocean
- Has the most trees per area in Canada (= the most dense forest) because of the high rain fall and warm weather
- Mostly coniferous trees



### 5. Mixed Forest Region

- Made up of both coniferous and deciduous trees
- Trees are cut down mostly for paper and building lumber
- The sugar maple trees in this forest is where we get maple syrup from



# Exercises

Answer the following questions on forest location. You may need to look at the classroom maps.

1. The boreal forest covers 1 territory and 8 provinces. What are they?
 

a.	b.
c.	d.
e.	f.
g.	h.
i.	
  
2. Which of Canada's forest regions is located the furthest north? \_\_\_\_\_
  
3. Toronto, Canada is located nearest which forest region? \_\_\_\_\_
  
4. The West Coast & Montane Forest Regions are located in British Columbia. Why does this region have the densest forests? \_\_\_\_\_  
 \_\_\_\_\_
  
5. List 2 forest regions whose trees are used to make paper: \_\_\_\_\_  
 and \_\_\_\_\_

### Circle True or False

1. The boreal forest is made up mostly of deciduous trees	T	F
2. Trees don't grow well in the taiga forest region because it's too cold	T	F
3. The wood from the boreal forest is used mainly to make pencils	T	F
4. It is difficult to get to areas in the taiga region because there are no roads	T	F
5. It rains a lot in the West Coast & Montane Forest Regions because they are close to the Pacific Ocean	T	F
6. Maple syrup comes from the taiga forest region	T	F
7. There are less trees on the prairies than in the 5 forest regions of Canada	T	F
8. The mixed forest region is likely to receive acid rain	T	F
9. The mixed forest region is Canada's biggest forest	T	F
10. The West Coast & Montane Forest Regions span 5 provinces	T	F

## Canada's Forest Industries:



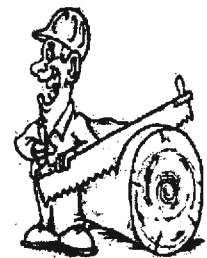
### There are several forest industries in Canada:

1. Lumber industry - the companies who harvest wood from the forests, process the wood (de-bark it, cut it to pieces, make 2x4's, etc.), and sell the wood to other companies.
2. Pulp and paper industry - the companies convert wood to pulp and/or paper and sell their products to other companies. Pulp is a mixture of water and pulverized wood used in the production of paper, cardboard, fiberboard, rayon, cellophane, and other products. Paper is also made from wood by drying out wood pulp in long sheets.
3. 'Other forest products' - This catch-all sector includes the type of companies that are involved in manufacturing products from wood. These companies might make products such as veneers, plywood, or engineered wood products. This sector can also include companies who make a diverse range of wood products, such as doors, windows, and furniture.

## Forestry, the Economy, and Jobs

Forests play an important role in the economic (\$) lives of Canadians. Approximately 1 out of every 16 people in Canada has a job that depends on forestry, whether they are cutting down trees or simply processing paperwork dealing with forestry. The forest industry produces about \$80 billion of profit for Canada per year! More than half of this money comes from selling our forest products to other countries (exporting it).

The forestry industry supplies more than 360 000 'direct' jobs for Canadians. (A direct job = means that the people are actually cutting or processing trees or involved in manufacturing). However, another 500 000 jobs are 'indirectly' created to support the forestry industry. (An indirect job = means those workers that support the forestry industry, but do not directly work in forests or manufacturing plants). These 'indirect' jobs can range from supplying machinery to the foresters, organizing the distribution of wood products, creating forest management plans, or even the accountant who calculates the workers' paychecks.



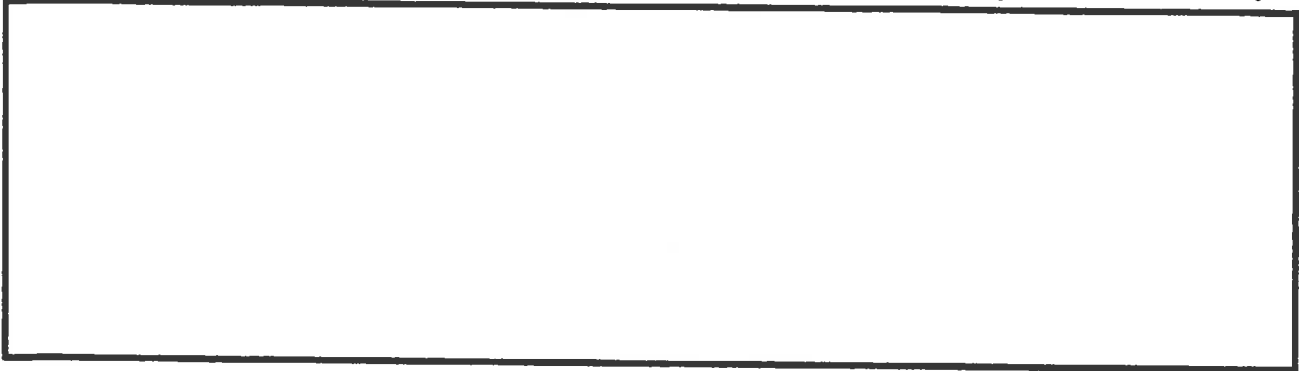


# Exercises

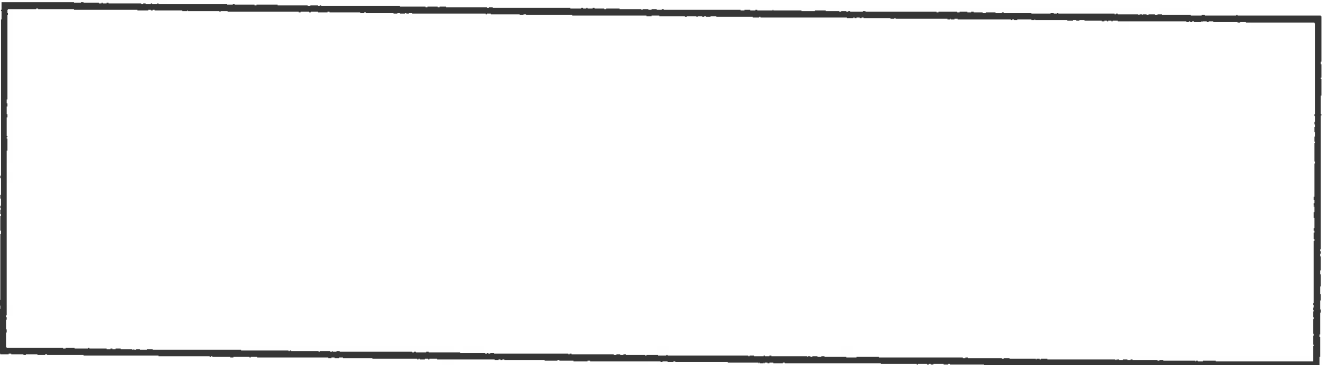
Circle the best answer:

1. The lumber industry:
  - a. Harvests wood
  - b. Makes furniture
2. Lumber can be used to make:
  - a. Wood products
  - b. Plastic products
3. Paper comes from
  - a. The ground
  - b. Trees
4. Pulp is a mixture of wood particles and:
  - a. Soil
  - b. Water
5. A cabinet maker would belong to which industry?
  - a. The 'other forest products' sector
  - b. The lumber industry
6. 1 in \_\_\_\_\_ Canadians has a job relating to forestry
  - a. 16
  - b. 61
7. Harvesting our forest resources \_\_\_\_\_ our economy:
  - a. Hinders
  - b. Helps
8. A forester who operates a chainsaw and cuts down trees would have a(n)
  - a. 'direct' forestry job
  - b. 'indirect' forestry job
9. A person who sells hardwood flooring would have a(n)
  - a. 'direct' forestry job
  - b. 'indirect' forestry job
10. Most of the \$80 million in profit comes from
  - a. Making paper
  - b. Exporting wood products
11. There are \_\_\_\_\_ directly related forestry jobs than indirectly related forestry jobs
  - a. More
  - b. Less
12. Canada has plenty of wood as a natural resource
  - a. True
  - b. False
13. Many people would likely lose their jobs if we did not manage our forests properly
  - a. True
  - b. False

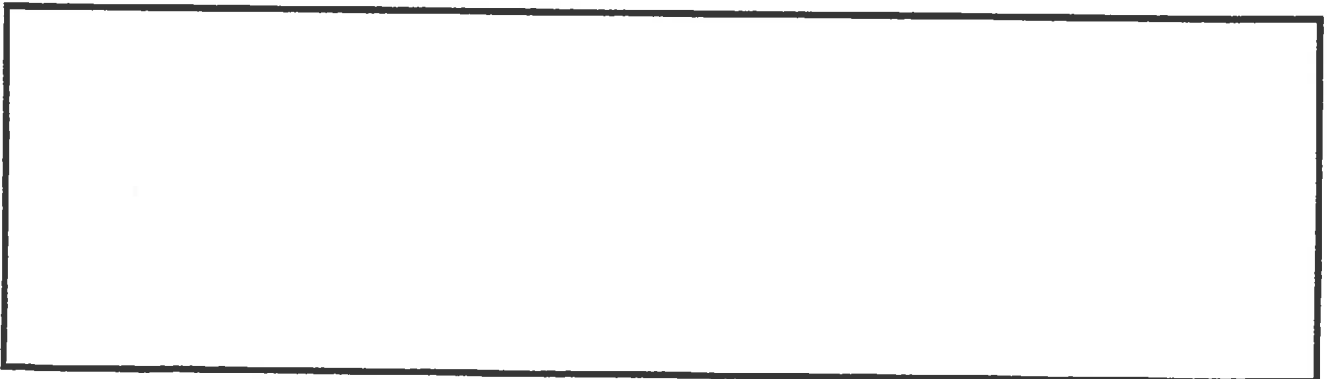
The lumber industry harvests wood from the forests so that we can make products from it. Draw a finished product of something that would use the wood purchased from the lumber industry (remember they make things like wood planks and beams):



The pulp and paper industry makes paper from wood. Everyday we use things that are made from paper. Draw a finished product of at least 1 thing that you use / read that is made from paper:



The last group of industries makes different kinds of finished products from wood, such as plywood, furniture, doors, and windows. Draw at least 1 picture of a finished product that would be made from this industry.



## Threats to the Forests

Forests provide a crucial natural, renewable resource for humans, however there are some threats that can seriously damage our forests

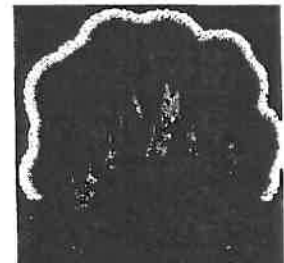
### 1. Environmental Hazards

There are three important environmental hazards that pose risks to our forests. The first is acid rain. Acid rain is caused when gasses and chemicals that we release into the atmosphere become incorporated in raindrops. When the rain falls on forests, it is poisonous to the trees. Acid rain is more common around large cities that emit many harmful gasses into the atmosphere from vehicles and industrial areas. Acid rain is a growing problem in Quebec as well as in Eastern Canada. The second and third environmental hazards are insect pests and tree diseases. Some harmful insects include tent caterpillars and the pine bark beetles. Insects often damage parts of the tree, making them more prone to disease, and resulting in dead or unhealthy trees.



### 2. Forest Fires

Fires are a natural part of the lifecycle of forests. In fact, fires can be healthy to forests because it clears out all the old and dead trees, and encourages the growth of new healthy trees. Some trees, like the jack pine, actually require intense heat from fires to 'unlock' the seeds from their pine-cones. However, fires can become a problem when they occur in forests that are valuable for timber (wood). Every year approximately 9500 fires burn 30 000 square kilometers of Canada's forests. Almost half of all fires are caused by lightning. The other half of fires are caused by humans.



### 'Smart' Forestry

'Sustainable development' is a way for people to use resources, such as trees, without the resources running out. This means that we cannot be greedy and take all the trees we want from our forests. Forestry involves lots of planning from year to year so that we know how many trees we can cut, how many trees will grow, and how the threats to the forests will also play a role. Managing our forests wisely is also important because we use our forests for recreation (= fun activities) such as camping, hiking, canoeing, and fishing.



# Exercises

1. What are the 4 main threats to our forests?

---

---

2. What is unique about the jack pine tree? \_\_\_\_\_

---

3. Why is fire sometimes a good thing for forests? \_\_\_\_\_

---

---

4. When is fire a bad thing for forests (and humans)? \_\_\_\_\_

---

---

5. What is your favorite thing to do in forests? \_\_\_\_\_

---

---

6. What is one way that we can reduce acid rain? \_\_\_\_\_

---

7. Sometimes forest officials perform 'controlled burns' which is setting fires on purpose, but closely monitoring and controlling the fire. These burns simulate the natural occurrence of forest fires in order to clear out dead old trees. Can you think of any risks of performing controlled burns? \_\_\_\_\_

---

---

---

8. Forests are home to many wildlife as well as different kinds of trees and plants. Can you name a few that we find in Canada? \_\_\_\_\_

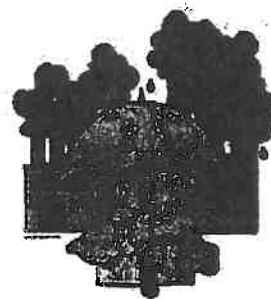
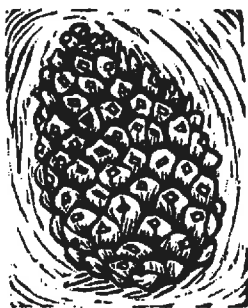
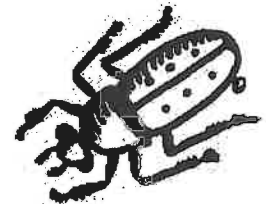
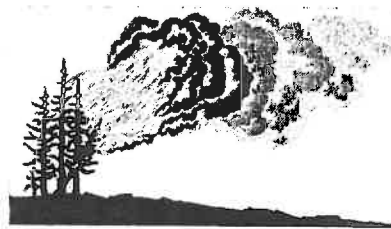
---

---

Match the first part of the sentence to the last part by writing the appropriate letter on the lines provided

1. When harmful chemicals become incorporated in rain drops, it's called: \_\_\_\_\_ sustainable development
2. Insects can damage trees, making them more prone to \_\_\_\_\_ humans
3. When we manage renewable resources so that we use them but don't run out of them, it's called \_\_\_\_\_ wood
4. About half of the fires in Canada are caused by lightning, and about half are caused by \_\_\_\_\_ recreation
5. Forests are good not only for natural resources, but also for \_\_\_\_\_ disease
6. Timber and lumber are words meaning \_\_\_\_\_ acid rain

Match the following images to the terms below:



Lightning  
Pest

Recreation  
Pine-cone

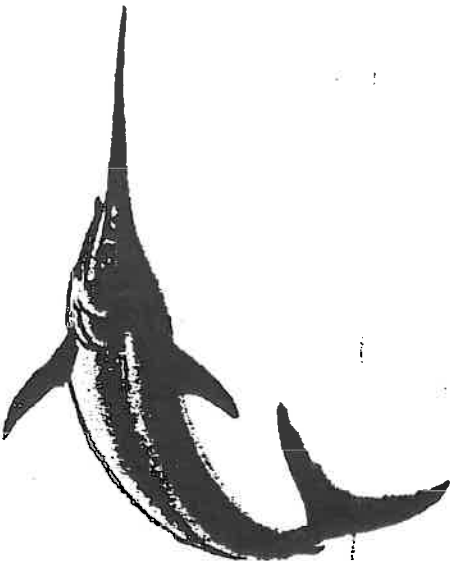
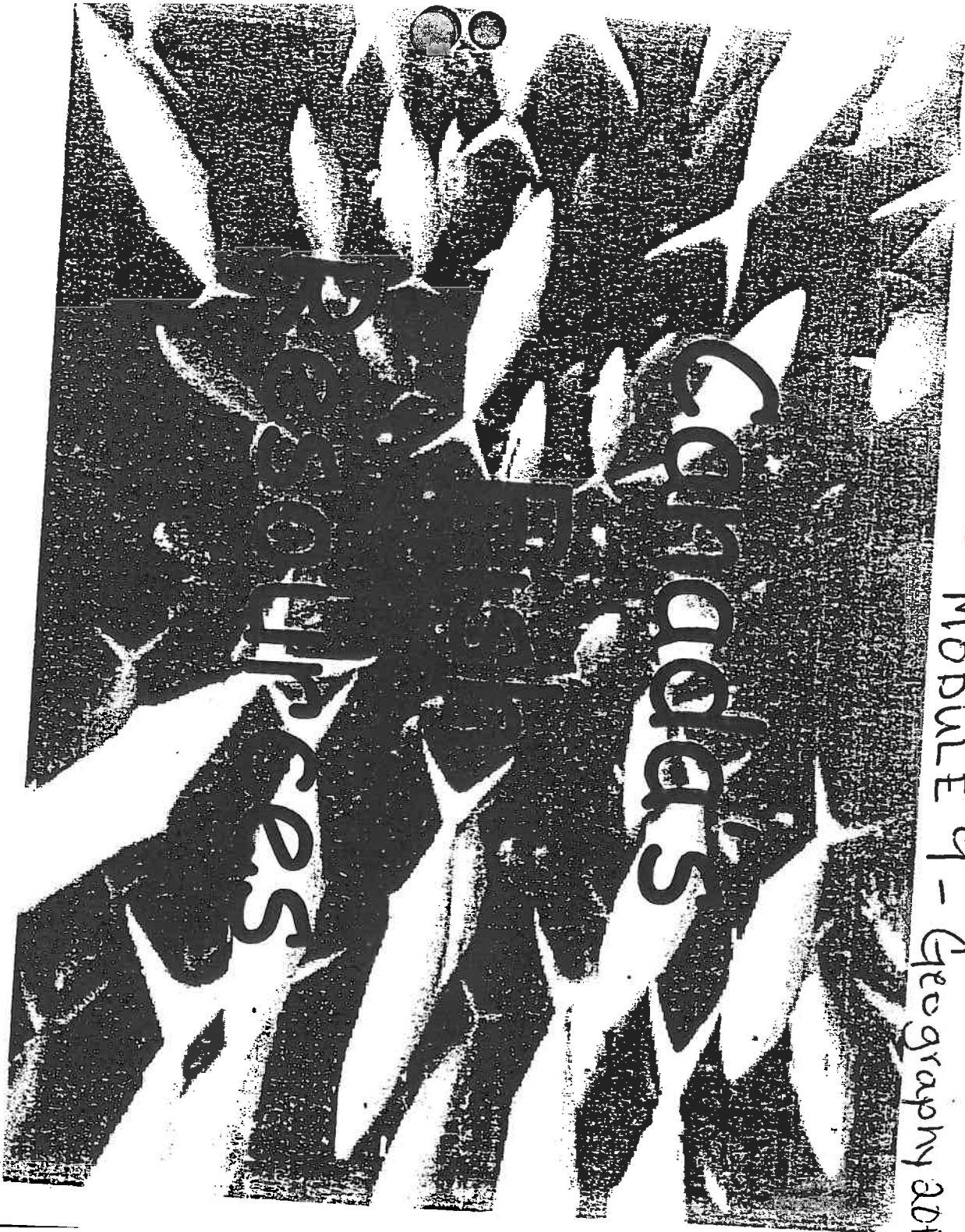
Acid Rain  
Forest Fire





me : \_\_\_\_\_  
Date: \_\_\_\_\_

MODULE 9 - Geography 201



## Fast Fishing Facts:

- Fish are a renewable resource unless they are 'over-fished' (fished too much)
- Ocean fishing is Canada's oldest industry
- Beginning in the 1500's, many Europeans set up summer fishing stations on the east coast of Canada. Some of these stations still exist today because they grew into cities.
- Commercial fishing = fishing that is done for a profit, so the fish are sold rather than kept for personal use / consumption.
- Commercial fishing occurs in 3 main areas: the East Coast, the West Coast and in some freshwater inland lakes.
- Canada is one of the world's leading fish exporters. One reason for this is that Canadians don't eat much fish. The United States is one of our biggest customers. Others include Western Europe, and Japan.

## There Are 3 Categories of Fish Caught in Canada's Oceans:

### 1. Groundfish

- These are the fish that feed and are caught near the ocean floor
- Ex: cod, pollock, haddock, halibut, redfish



### 2. Pelagic Fish

- These are the fish that are found in the open water. They feed and are caught near the ocean
- Ex: salmon, herring, mackerel, tuna

### 3. Shellfish

- These are aquatic creatures with shells
- Ex: shrimp, lobster, oyster, crab, scallops





## Canada's East Coast Fishery:

Until recently, the oceanic waters off the coast of Canada's East Coast were one of the world's best fishing grounds. There were several favorable conditions on the East Coast that produced very good fish:

- a. **The continental shelf:** A continental shelf is the gently sloping portion of a coastline that is under water. The Atlantic continental shelf is fairly shallow. This allows sunlight to penetrate the water right to the bottom which grows plankton (= fish food) and attracts a large amount of fish.
- b. **The oceanic currents:** On the East Coast, two currents - 1 warm and 1 cold, meet each other. When they meet, it stirs up nutrients that have settled to the ocean floor, creating even more food for plankton and fish.

## Collapse of the East Coast Fishery:

*A 'collapse' of a fishery means that a certain type of fish has been over-fished to the point that population numbers plummet drastically and it is no longer safe to catch that particular type of fish because they are at risk of extinction.*



In the 1980's, people employed in the East Coast fishing industry relied on groundfish, especially northern cod, as their source of income. But, they began to notice that they were catching fewer and smaller fish. Particularly, the northern cod fish off the coast of Newfoundland and Labrador seemed to be disappearing. Finally in 1991 the cod fishery collapsed. One fishing village reported catching only 3 cod in 1992! By 1992 the government completely banned all fishing of northern cod, and drastically reduced the quota (=the number of fish allowed to be caught) for many other groundfish species.

## So Why Did the East Coast Fishery Collapse?

While no single cause is solely responsible, several reasons have been proposed to explain the collapse of the East Coast fishery.

1. **Overfishing.** Each year, the federal government set the number of fish allowed to be caught too high. Each year, more fish were being removed from the ocean than were reaching the age of maturity. When fish are caught before the age of

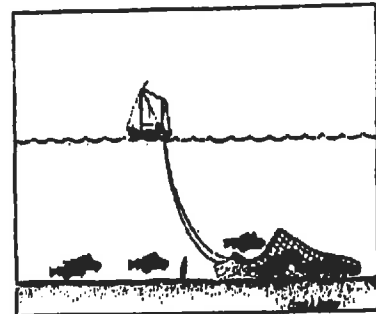
...urity, they do not get a chance to reproduce which is important for replenishing the oceans with fish.

2. **Improved Fishing Technology.** Following World War II, larger, more powerful boats were developed which were then used for fishing. Other technology was also developed such as fish-finders and sonar. Hence, while finding schools of fish in the past was based on skill and guesswork, these technologies made finding masses of fish easy...too easy.



3. **Uncontrolled Foreign Fishing.** Foreign fishing boats (boats from countries other than Canada) at that time were traveling far distances and doing massive amounts of fishing in the waters off Canada. As a result, in 1977, Canada was finally granted permission to extend our political control from the shore line to 370 km out to sea to protect our fish stocks. This decision, however, was not made soon enough and the fish populations had already declined drastically.

4. **Destructive Fishing Practices.** Big fishing boats, called trawlers, often only fish for one type of fish at a time. However, they tend to catch other types of fish (such as northern cod) than the one targeted...these fish are called bycatch. The 'bycatch' fish die and are thrown back into the ocean, BUT they are not reported to the government as being caught. This dwindles their populations 'unknowingly'.



5. **Changes in Natural Conditions.** One last factor that may have also contributed to the collapse of the East Coast fishery was oceanic changes. Since the mid 1980s, temperatures have dropped and salt levels have changed in the waters surrounding Eastern Canada. This may have changed the migratory patterns of some fish to avoid these areas.

Please answer the following questions.

1. What about the continental shelf made ideal conditions for fish? \_\_\_\_\_  
\_\_\_\_\_

2. What happens when a warm current meets a cool current? Why is this good for fish? \_\_\_\_\_  
\_\_\_\_\_

3. What is a fishery collapse? \_\_\_\_\_  
\_\_\_\_\_

4. What are some of the reasons why humans were responsible for the collapse of the East Coast fishery? \_\_\_\_\_  
\_\_\_\_\_

5. Does it surprise you that humans can have such an impact on the numbers of fish in the ocean? Why? \_\_\_\_\_  
\_\_\_\_\_

Matching - using the word bank below, write the letter of the appropriate answer beside each phrase/sentence

- 6. better boats, fish finders, less 'guess work' \_\_\_\_\_
- 7. boats from other countries fishing in Canadian waters \_\_\_\_\_
- 8. a change in the water temperature and salt levels \_\_\_\_\_
- 9. catching 'undesired' fish by accident, throwing them overboard, but not accounting for them \_\_\_\_\_
- 10. overestimating the number of fish available in nature and fishing too much \_\_\_\_\_

A. Uncontrolled foreign fishing	B. Destructive fishing practices	C. Improved fishing technology	D. Changes in natural conditions	E. Overfishing
---------------------------------	----------------------------------	--------------------------------	----------------------------------	----------------

Answer the following questions:



1. Here is a map of Canada including lakes, rivers, and the oceanic coasts. Circle 3 areas where commercial fishing would occur - 1 of which must be a freshwater location.

2. Why are fish a renewable resource? \_\_\_\_\_

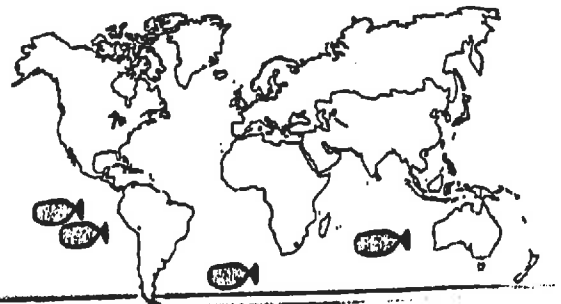
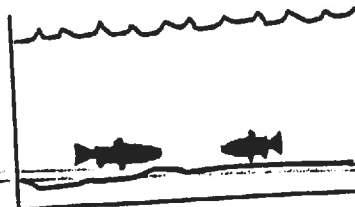
3. Name the 3 types of ocean fish that are caught, and give 2 examples for each:

- a.
- b.
- c.

4. Which types of fish have you eaten? \_\_\_\_\_

5. Why do you think people in other countries eat so much more seafood than Canadians? \_\_\_\_\_

Label the following pictures using the words provided below:



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Groundfish	Shellfish	Pelagic Fish
------------	-----------	--------------

## Canada's West Coast Fishery

The most important fish for the fishing industry on the West Coast is salmon. There are 5 types of salmon: coho, chum, pink, chinook, and the most valuable of all, sockeye. Every summer/fall, salmon fish make the migration from the open Pacific



Ocean to freshwater streams in B.C. where they lay their eggs. It is here, at the junction of the ocean and freshwater streams, where fishing boats wait to catch the salmon. In 1994, approximately 1 million fewer salmon arrived to the freshwater streams than scientists had estimated and the West Coast Fishery also collapsed.

### So Why Did the West Coast Fishery Collapse?

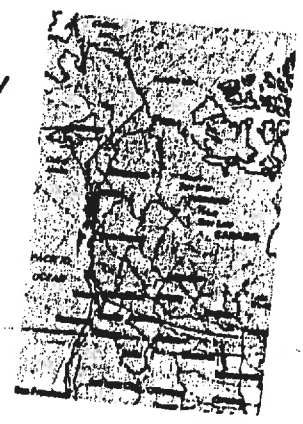
The main reason for the collapse was poor estimates of how many fish were available in the oceans which led to overfishing.

1. **Overfishing.** Every year over 800 000 tones of salmon were caught each year between Alaska, B.C., and California. Too many fish were being caught, and not enough reaching the age to reproduce to replenish the fish population.



2. **Changes in the Environment.** Global warming seems to be warming the Pacific Ocean. This is bad news for salmon who prefer waters cooler than 7°C. Hence, some salmon may have moved northward, beyond the Canadian fishing range, seeking cooler waters.

3. **Lack of a Salmon Treaty.** Canada and the United States have long disagreed about where salmon should be caught and how many can be caught. Canadian officials claim that fewer salmon should be caught in order to preserve the fish populations, however the United States, particularly Alaska, claim that there are plenty of salmon, so fishing restrictions are not needed. As long as there is a disagreement on acceptable fishing limits/ranges between Canada and the USA, salmon populations are at risk.



Please answer the following questions.

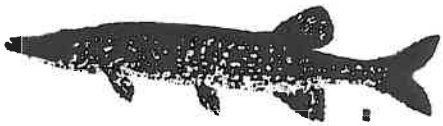
1. Why do salmon migrate from the oceans into freshwater streams? \_\_\_\_\_  
\_\_\_\_\_
2. Scientists extremely under-estimated the number of salmon returning to BC by approximately 1 million fish. What reasons could there be to explain this? \_\_\_\_\_  
\_\_\_\_\_
3. What kind of impact do you think this had on the fishermen who were anticipating way more fish that season? \_\_\_\_\_  
\_\_\_\_\_
4. Why is it important that Canada and the USA agree on proper fishing techniques? \_\_\_\_\_  
\_\_\_\_\_
5. Where do the fishing boats wait for the salmon to arrive? \_\_\_\_\_  
\_\_\_\_\_

True or False - Circle T or F

6. Salmon is the most important fish on the West Coast	T	F
7. Groundfish are the most important fish on the East Coast	T	F
8. Overfishing is mainly to blame for the collapse of both the East Coast and West Coast fisheries	T	F
9. A decrease in temperature in the waters surrounding BC may have led to a change in the salmon's habitat	T	F
10. Canada is not concerned about the number of salmon remaining in nature	T	F
11. Even immature fish can reproduce	T	F
12. 1 million fewer fish returned to the freshwater streams because they had been overfished in previous years	T	F
13. Humans value the coho salmon the most	T	F
14. Salmon travel from saltwater into freshwater	T	F
15. Canada was harvesting over 1 million tons of salmon each year	T	F

## Freshwater Fisheries

Canada's freshwater fisheries occur in inland lakes and rivers. The main industries are located in the Great Lakes (Huron, Ontario, Michigan, Erie, Superior), Great Slave Lake in the NWT, and Lake Winnipeg. The major species caught and sent to market from these lakes are whitefish, perch, pickerel, and trout.



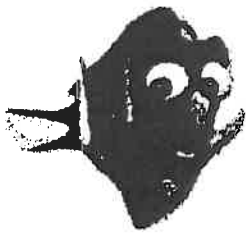
## Sport Fishing & Recreation

For most people, going fishing is simply a pleasant way to spend a summer day. They do not realize that 'sport fishing' is a major industry and money maker for Canada. Many people come from different countries to fish in Canada for pleasure, and while they vacation here, they feed our economy. This is because not only are they purchasing fishing supplies, bait, and so on, but they are also paying for food, lodging, gas, boats, etc. Two thirds (2/3) of our international visitors who come here to fish do so in Ontario.



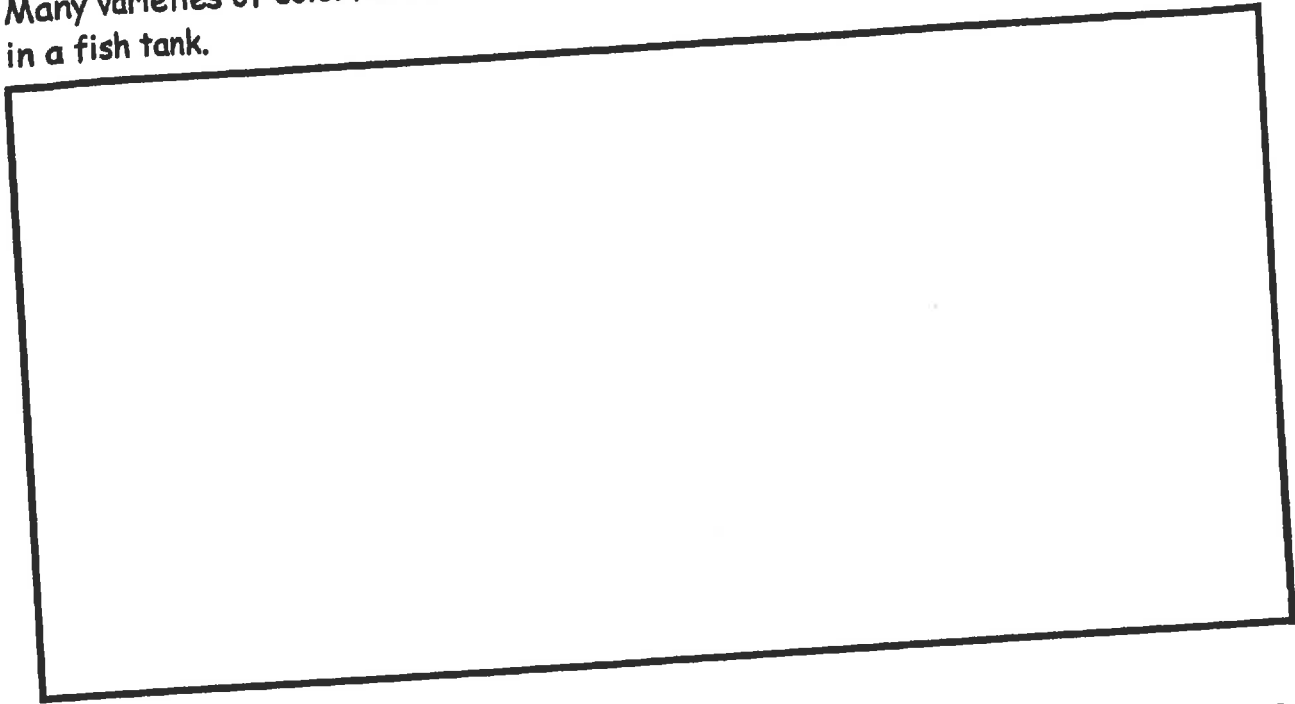
## Global problem = Global Solutions??

Canada is not alone in the fishery crisis. Many other nations have experienced a complete collapse of certain fish populations. There is a global trend of depleting numbers of fish which began in 1970s. The World Wildlife Fund reports that 70% of the world's most valuable fish populations are depleted / overfished. So what can we do? Well, it's important to remember that fish ARE natural resources, therefore, if we fish carefully they will replenish themselves and we will have fish left for future generations. This may mean stopping all fishing efforts for certain species of fish to let their population numbers bounce back. Unfortunately, some types of fish populations have been fished to the point that scientists are unsure if their population numbers will ever come back to what they once were. Before we overfish the remaining species of valuable fish, it is important to learn from our mistakes and make an honest effort to preserve what is still available in nature. This may mean passing laws to do so.

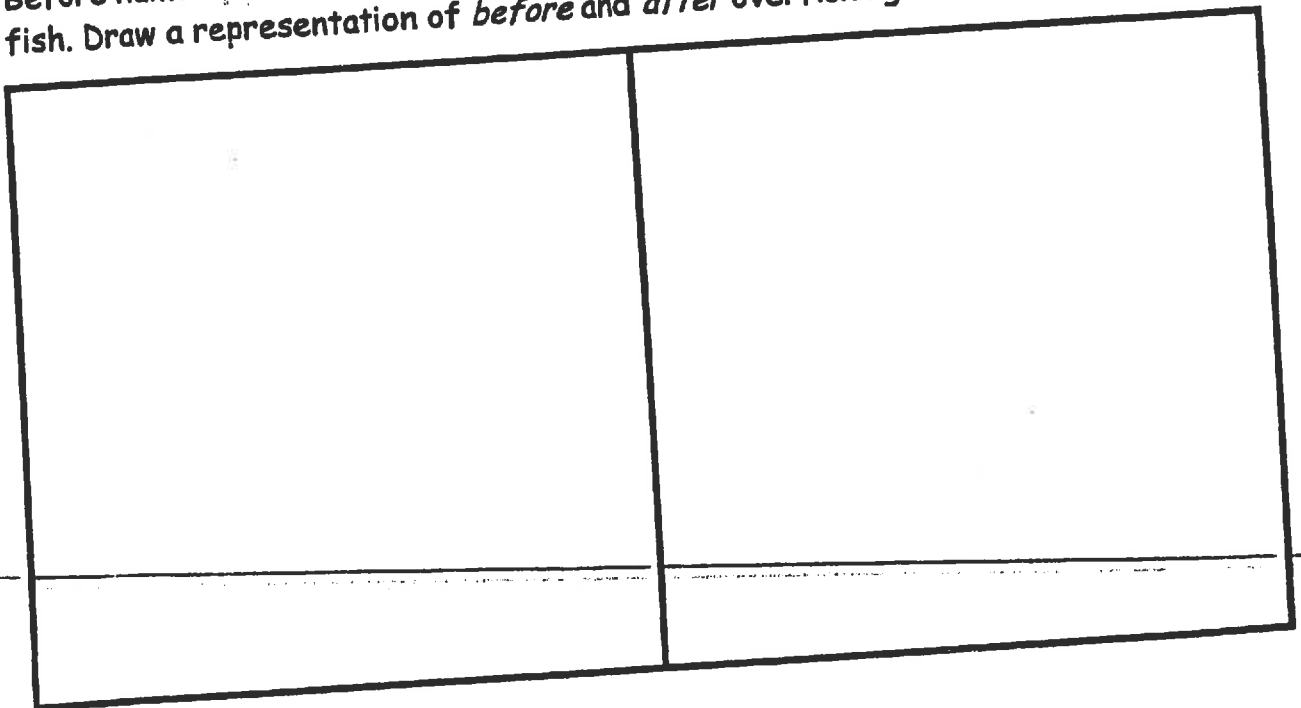


**Art Box:**

Many varieties of colorful fish are also found in our oceans. Draw a picture of fish in a fish tank.



Before humans overfished certain species, the oceans were much more plentiful of fish. Draw a representation of *before* and *after* overfishing occurred.





1. Fish are not only an important resource for humans but are also essential to ecosystems within the oceans and freshwater. What do you think might happen to the food chain if we over-fished a certain type of fish? \_\_\_\_\_  
\_\_\_\_\_

2. Why is sport fishing so good for Canada's economy? \_\_\_\_\_  
\_\_\_\_\_

3. Examine a map of Canada. Why do you suppose that Great Lakes, Great Slave Lake, and Lake Winnipeg are the main locations for freshwater fisheries? \_\_\_\_\_  
\_\_\_\_\_

4. Most sport fishing occurs in which province? \_\_\_\_\_

5. What is one strategy we can do to help recover the fish populations that we have overfished? \_\_\_\_\_

**Multiple Choice:**

6. An example of a freshwater fish is  
a. pickerel  
b. salmon

7. An example of a saltwater fish is  
a. cod  
b. trout

8. More than \_\_\_\_\_ of the world's most valuable fish populations have been overfished or depleted somehow.  
a. 10%  
b. 70%

9. Some fish populations have been depleted so much, scientists are unsure if their population numbers will ever go back to normal  
a. true  
b. false

10. Sometimes the only way to get people to stop overfishing is to  
a. ask politely  
b. pass a law

