Alaska Studies Connection

Unit Two

"Alaska...Naturally"

CHECKLIST 2.9

Name: _____

Date: _____

You will need to send the following to your advisory teacher after completing Lessons 9-11 and Assessment 3.

___ **Assessment 3**

Lesson 9

___ Learning Log

___ 1 Extension Activity (list)

___ _____

___ Sourdough Lingo

Lesson 10

___ Learning Log

___ 2 Extension Activities (list them)

___ _____

___ _____

___ Sourdough Lingo

Lesson 11

___ Learning Log

___ 1 Extension Activity (list)

___ _____

___ Sourdough Lingo

Unit 2, Lesson 9 Ocean Options

Here is Lesson 9, which discusses natural resources, especially ocean resources.

It will take you 7 class periods to complete the minimum requirements.

Coming up: Look at the activities in Lesson 13 now to see if you need to order any materials.

Warm-up: Complete this first.	☐ Sorting Resources, p. 207
Information: Complete this next.	☐ Ocean Options, pp. 209-217
Extension Activities: Complete at least one.	☐ 1. Ocean Research Project, p. 218* ☐ 2. Alaska Ocean Resources, poster / book, p. 220 ☐ 3. A Dinner for King Neptune, cooking, p.221* ☐ 4. Fish Printing, p. 222 ☐ 5. Construction of a Fish Wheel, model, p. 224 ☐ 6. Commercial Importance of Salmon, p. 225* ☐ 7. An Oceanographer Exploring Alaska's Waters, ☐ creative writing, p. 226* 8. An Editorial, creative writing, p. 226* ☐ 9. Fish Net, audio, p. 227* ☐ 10. Ecosystems: Oceans, video, p. 228* ☐ 11. Sea School: 5 Choices, video, p. 229* ☐ 12. Surimi, video, p. 231 ☐ 13. Vocabulary Activity, computer, p. 232* ☐ 14. Extended Reading, see back of this sheet * * May be sent by e-mail if student has access
Sourdough Lingo*: Complete this as you study the lesson.	☐ resources, natural, inexhaustible, renewable, non-renewable, limited entry, longlining, purse seiner, gillnetting, troller, trawler, mariculture, bottomfish
Alaska Trivia*: Optional	☐ Super Salmon, p. 233
Assessment:	Have you learned all the objectives? No assessment after this lesson...

Extended Reading List

Lesson 9

A Whaler & Trader in the Arctic 1895-1944, A.J. Allen

The Silver Years on the Alaska Canned Salmon Industry, L. Freeburn

The Pacific Halibut, F.H. Bell

Neptune's Revenge, A.W. Simon

Alaska's Salmon hatcheries 1891-1959, P. Roppel

Alaska Blues: A Fisherman's Journal, J. Upton

Fisheries of the North Pacific, R.J. Browning

Indian Fishing: Early Methods on the Northwest Coast, H. Stewart

Use of the Sea by Alaskan Natives, K. Josephson

The Book of Whales, R. Ellis

The World of the Walrus, R. Perry

Alaska's Saltwater Fishes and Other Sealife, D.W. Kessler

People of the Ice Whale, D. Boeri

WARM UP 2.9

Sorting Resources

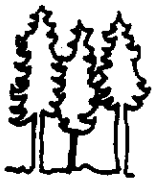
Natural resources are things useful to people that are found and produced on the land and in the water. Everything might be considered a resource, but we usually only consider certain valuable items to be natural resources. Generally these are divided into two classes: renewable resources – those commodities that grow back or are replaced with time; and non-renewable resources – those commodities that, once removed, are not replenished, at least not during our lifetimes. Some resources, available in unlimited quantity and not able to be totally used up, are called inexhaustible resources.

Choose the best answer according to the above definitions: place an R in the box if the resource is renewable. Place an N in the box if the resource is non-renewable. Place an I in the box if the resource is inexhaustible.

☐ chickens 

☐ natural gas

☐ coal 

☐ spruce trees 

☐ alcohol

☐ caribou 

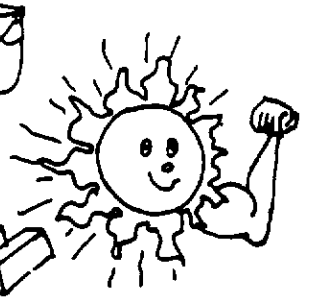
☐ agricultural soil 

☐ potatoes 

☐ copper 

☐ scenery 

☐ water 

☐ solar energy 

☐ gold

☐ lichens 

☐ salmon 

☐ hydroelectric power

☐ whales 

☐ furs and skins 

Circle those resources which can be found readily within a mile of your home.

OBJECTIVES 2.9

Ocean Options

Here's what you will be studying in Lesson 9. Upon completion, you should be able to answer these questions:

- What are natural resources?
- What are some problems and issues related to the development of Alaska's natural resource potential?
- What are five ocean resources important to Alaska's economy?
- Can you describe three fisheries in Alaska?
- What are some new trends in fish processing?
- Where does Alaska sell most of its fish?
- How does the exploration for ocean resources and their development affect Alaskans?
- How do state, federal, and international regulations affect Alaska's fisheries?
- How does limited entry affect Alaska's fishermen?
- Do we have marine species that are being farmed now or which could be farmed?
- What are some advantages and disadvantages of mariculture?

Ocean Options

WHAT ARE NATURAL RESOURCES?

On Unmak Island in the Aleutians nestles an ancient Aleut village called Nikolski (Chaluka), which sits atop mounds of shell and animal bones up to twenty feet thick. These mounds are mute testimony to the hunting and gathering of many generations of Aleuts. This village, and many others along the North Pacific coast of Alaska, probably owe their existence to a very valuable resource, the salmon. Everywhere there were salmon runs, people settled to take advantage of this abundant food resource. Broadly defined, **natural resources** are naturally occurring materials, energy, or features that supply our basic needs or produce wealth.

We have three categories of natural resources: inexhaustible, renewable, and nonrenewable. **Inexhaustible resources** are those available in unlimited supply, like the sun's energy. **Renewable resources** include soil and living resources like wildlife and forests. They are limited in quantity, but can be restored as they are used. **Non-renewable resources** can't be restored as they are used up. They include mineral resources: metals and fossil fuels such as coal, petroleum, and natural gas.

Living resources are plants and animals: the forests of spruce, hemlock, and birch; the salmon, marine mammals, and shellfish that live in our oceans; and land animals like the caribou, moose, deer, otter, and bear. In this lesson, we will study the living resources of the ocean. In Lesson 11 we will learn about Alaska's timber resources.

Living or biological resources are important for our survival, since they supply all the food we eat. Many groups of Alaska Natives were able to establish sophisticated cultures because the abundance of natural resources gave them time to pursue interests other than day-to-day survival.

Southern coastal villages depended largely on salmon and shellfish. Farther north, where these resources became less numerous, Native populations were smaller, because they depended on marine mammals and caribou, which were harder to hunt. Today, our plant and animal resources are still important to all Alaskans.

Mineral resources are less important in directly supporting life, but they contribute towards our modern cash economy and industrial society. Alaska has the nation's largest supply of oil, which is the major contributor to the state economy. There are also large deposits of natural gas, coal, and minerals such as gold, molybdenum, silver, copper, and zinc. We will study about these in Lesson 12.

One of the greatest resources of all in Alaska is its human resource - the talents and skills of the people who live here and contribute to the economy and well-being of our state. The land itself is a valuable resource. In addition, the influx of others wishing to see the beauty and vitality of our state contribute heavily to our economy with their tourist dollars. We will study about this resource in Lesson 13.

CAN YOU IDENTIFY ALASKA'S MAJOR NATURAL RESOURCES ON A MAP?

We have mentioned many of the resources that are present in Alaska. Study the maps in PGA pp. 145, 146, 148, and 151. Find the resources in your area.

WHAT ARE SOME PROBLEMS AND ISSUES RELATED TO THE DEVELOPMENT OF ALASKA'S NATURAL RESOURCES?

Management of living resources is important because the resource can be destroyed by overharvesting. For this reason, the state and federal governments regulate how much timber may be cut, and where it can be cut. They have set aside some areas to remain in their natural state to protect another valuable resource--wildlife (not to mention the scenic value). The Alaska Department of Fish and Game sets limits on gear, areas, seasons, and amounts of fish to be taken from our oceans and streams. Biologists study these and other living resources to ensure they are being managed properly.

Since nonrenewable resources will not replace themselves, that means once they are gone, they are gone for good. It is very important that we manage and use them wisely, selling them at the highest price. U.S. trade regulations, as well as transportation costs from Alaska to the markets, determine where our resources are sold.

Should we send our raw natural resources to markets, or should we process them into other products ourselves, to provide jobs for Alaska residents and more income for the state? This question is receiving more and more attention.

Many Alaskans, as you know, have traditionally used fish, game, forest, and soil to support their families and communities directly. The fish they catch, the moose they shoot, and the plants they grow and harvest are eaten by them and their families. This is called a **subsistence** (See Lesson 4 for definition) way of living. How many resources should be saved for those who practice a subsistence way of living? How many resources should be gathered by those who would sell them to make their living? And how many should be saved for the sports person? These questions a very important in our state.

WHAT OCEAN RESOURCES ARE IMPORTANT TO ALASKA'S ECONOMY?

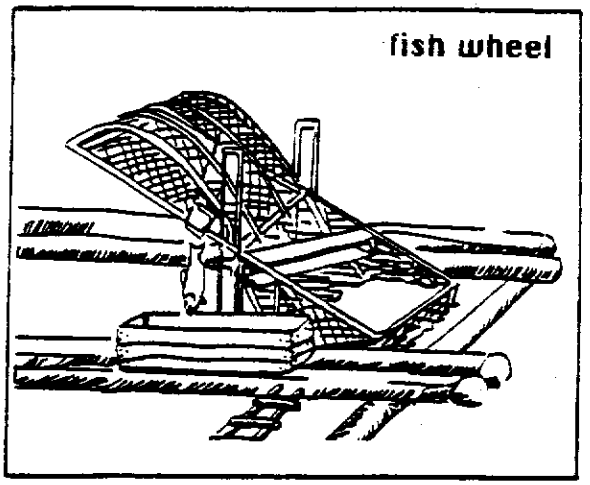
We are all aware of the importance of the oil at Prudhoe Bay to the Alaska economy. Oil is not really a resource from the ocean, but rather from below the ocean floor. In this course we will not discuss oil, or the materials gathered from below the ocean floor, as ocean resources.

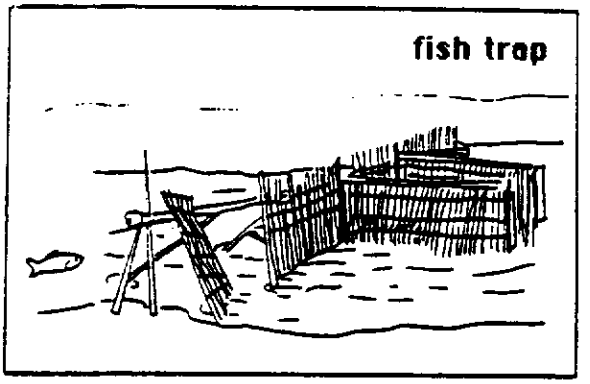
The ocean resource most important to Alaska is fish. Alaska's multi-billion dollar fishing industry is Alaska's largest employer, providing 80,000 jobs annually. It is the second-largest revenue producer after oil. Alaska's fisheries include salmon, halibut, bottomfish, crabs, shrimp, and sac roe herring.

CAN YOU DESCRIBE THREE FISHERIES IN ALASKA?

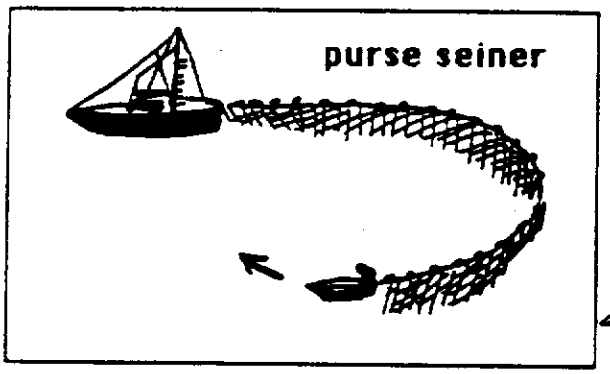
SALMON: Probably the most important and well-known fishery in Alaska is the salmon industry. Alaska produces 40 to 50 percent of the world's salmon. Five Pacific salmon species are harvested commercially in Alaska. Since all of these salmon must return to the stream of their birth to reproduce, or spawn, and since they usually return at the same time each year, they can be caught easily.

Commercial fishermen use various methods to catch salmon in large quantities. The most efficient method of salmon fishing is with fish wheels, first brought to Alaska from the Great Lakes by early commercial fishermen. Fish traps were another way to catch lots of fish with little effort. They were usually built at the mouths of rivers, where salmon concentrated before moving upstream. They were used first by Natives, then by salmon canneries. Today fishtraps are outlawed, and only a few fish wheels are used on Interior rivers for subsistence fishing.

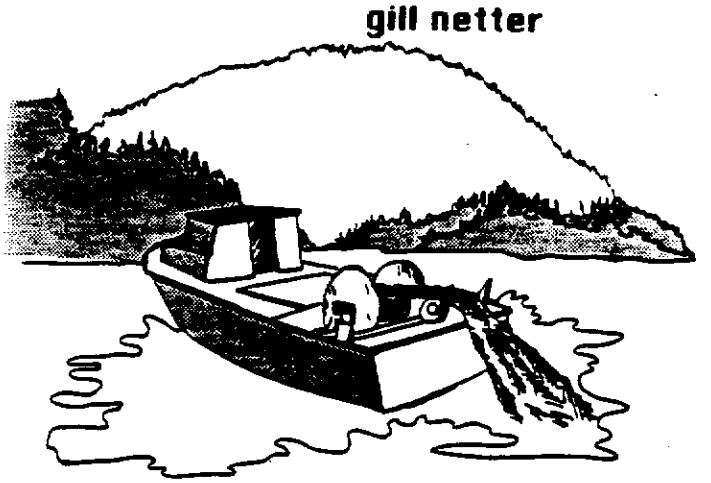




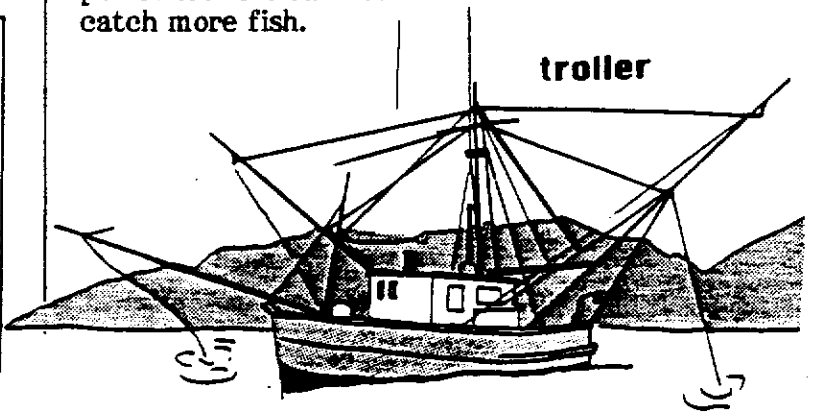
After fish wheels and traps, the best way to catch a lot of salmon is to use nets. Two netfishing methods are used in Alaska. To catch either salmon or herring, a net called a **purse seine** is used. This fishing is done near the ocean's surface. A large boat, called a purse seiner, sets the net by attaching one end to a skiff. This skiff holds the end of the net while the seine boat travels in a large circle. When the circle is set, the net is closed (or pursed) at the bottom, trapping all the fish that have been enclosed in the net. A large boom at the stern of the boat helps to lift the net and its load of fish aboard.



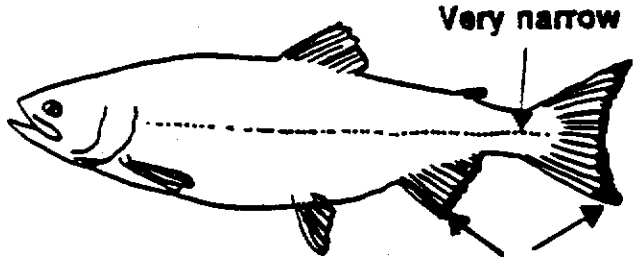
Another netfishing method is **gillnetting.** Walls of nets that hang from the surface are laid out in the path of the migrating salmon. When the salmon try to swim through the nets, many are caught by their gills. Different sized mesh is used depending on the species of salmon being fished. If nets are set from a boat, they are called driftnets. If they are set with one end on land, and the other end stretched out into the ocean, they are called setnets.



Commercial fisherman who don't use nets to catch salmon are called **trollers.** They use a system of leaders baited with herring or artificial lures suspended from a larger cable that hangs almost vertically in the water. As their boat moves slowly through the water, salmon bite on the lures. If trollers crank their lines in with their own muscle-power they are called hand trollers. If they use motors and hydraulic gear to pull their lines in they are called power trollers. Since it is easier to pull lines in with motors, power trollers can use more lines and catch more fish.

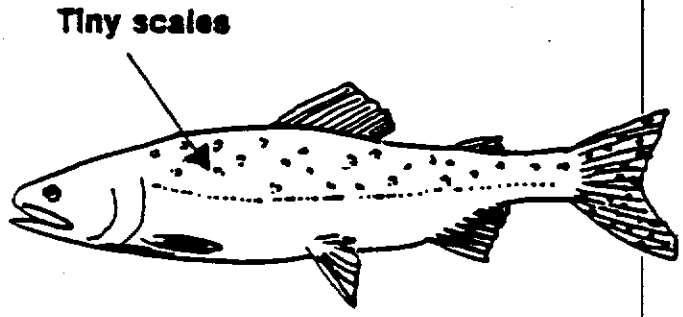


We have discussed the ways we catch salmon, but you probably know that we have five species of salmon here in Alaska. Each kind lives, is caught, and is used in slightly different ways. Here is a summary of our five kinds of salmon.



Chum or Dog

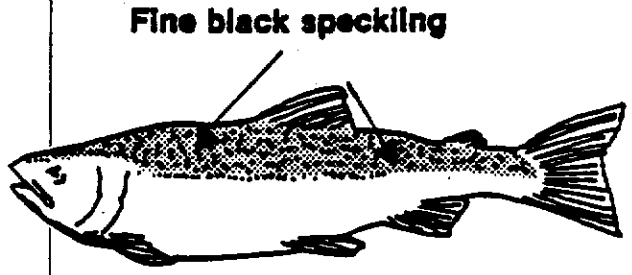
Chum salmon are the most widely distributed of the Pacific salmon, ranging from southeastern Alaska to the Arctic Ocean. Other common names for them are dog or calico salmon. In the arctic and northwestern Alaska, they are a traditional source of dried fish for winter use. They are about the same size as sockeye and coho salmon, and develop vertical bars of green and purple when they return to their spawning streams. They are usually caught with purse seines and drift gill nets. A smaller number are harvested with fish wheels and set gill nets, and they are occasionally caught by trollers.



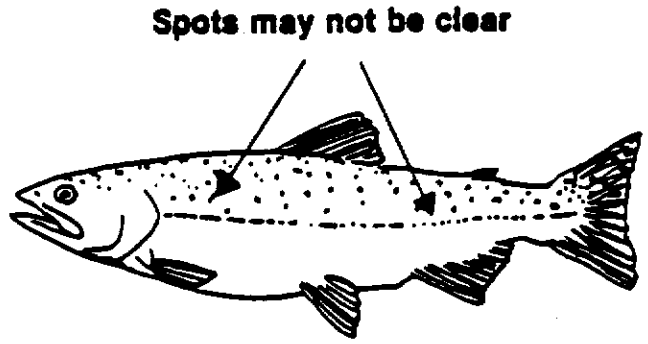
Pink or Humpback

Pink salmon are the smallest but most numerous of our salmon, and they range from Southeastern to the Arctic Ocean. Sixty-one percent of the salmon caught in Alaska's commercial fishery are pink salmon. They are mainly harvested by the purse seiners and gillnetters, since you have to catch lots of pink salmon in order to make money on them.

Sockeye salmon, also called red salmon, are an abundant salmon that range from Southeast to Nome. In their spawning colors, they have a bright red body with an olive green head. They are the most valuable salmon to the commercial market. Commercial fishing for sockeyes is done by drift gill net, purse seine, and set gill net. Bristol Bay is the largest sockeye-producing area in the world.



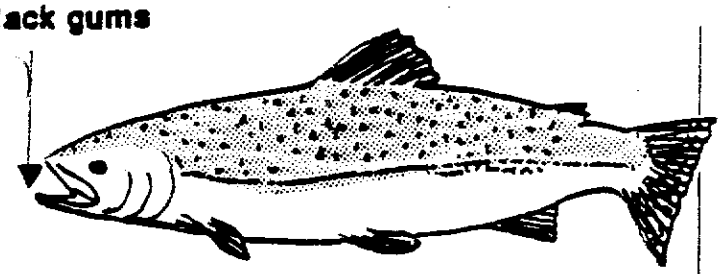
Red or Sockeye



Silver or Coho

Coho, or silver salmon, are the second largest species, averaging 10 pounds and 29 inches, although they can grow over 35 pounds and 35 inches. They are the mainstay of the commercial trolling fleet, as well as a popular sport fish. They are also caught by commercial seiners and gill netters.

Black gums



King or Chinook

The grandaddy of all Alaska salmon is the **king salmon**, also known as chinook salmon. These are the largest and least abundant of the Pacific salmon. Besides being the most sought after sport salmon, kings are harvested commercially in Southeast, Bristol Bay, and the Arctic-Yukon-Kuskokwim regions of the state. Most are taken with troll and gill net gear. King salmon usually bring the most money per pound of any salmon caught commercially.

BOTTOMFISH or groundfish are rapidly becoming the most important fishery in Alaska after the salmon fishery. Bottomfish are a group of 20 or so species that have firm, white flesh, like pollock, black cod, Pacific cod, rockfish, and various kinds of flatfish, like yellowfin sole. They have been caught in large numbers for years by foreign fishermen in the Gulf of Alaska. In 1976, the U.S. government instituted the 200-mile limit in coastal waters around the United States. This gives Americans control over most of the Gulf of Alaska waters and the resources in them.

Because Alaskan fishermen weren't particularly interested in catching bottomfish, and the other Pacific Rim nations like Japan, Korea, and Russia were, these countries were given permits to continue fishing in the Gulf of Alaska. After a few years, joint ventures were started, where American fishermen caught fish for foreign processing ships. As Alaskan and American fishermen purchased more gear and boats, more and more foreign fishermen were restricted from fishing in the Gulf of Alaska.

1986 was the last year that foreign fishermen were allowed to fish in the Gulf of Alaska. In that year, 136,000 metric tons of groundfish worth $55.2 million were caught in the area by American boats and an additional 1.2 million metric tons worth $142 million were harvested in joint ventures. Foreign fishermen caught 475,000 metric tons in the gulf, and now all that is up for grabs by American boats.

How do you catch bottom fish (groundfish) in the Gulf of Alaska? They usually live too deep to use conventional netting methods, and they are hard to catch by trolling. To catch groundfish, you would use longlining or trawling. **Longlining** uses a line spread along the sea bottom to which are attached gangions (gan-yans) that are tough leaders baited with herring or other bait fish. The fishermen set these lines, then pull them up a day or two later to retrieve the fish that have been caught. This is also the method used to catch halibut.

Trawling involves a net that is dragged along the bottom or near the bottom. Anything that lives on the bottom is scooped up into the net. Since this is the preferred habitat of bottom fish, it is a good method of catching them. Fishermen set a trawl, drag it along the bottom, pull it up to the boat, empty it, then set it to fish again in a continuous, 24-hour cycle.

HALIBUT: One of the most famous of Alaskan bottomfish is the halibut, which grows to monstrous size in Alaska. Halibut are a flatfish that are gray on the upper side and white on the lower side. Both eyes are on their upper side. They can grow to as large as 450 pounds, although the average adult size is 30 to 40 inches and 60 to 120 pounds. They live in continental shelf waters from southern California to Norton Sound. They have been fished commercially in these waters since 1888. Halibut are harvested by longlining, and the bait

used is octopus, herring, or other fish. The International Pacific Halibut Commission manages this fishery in conjunction with the Alaska Department of Fish and Game.

HERRING: In contrast to halibut, one of the smallest fish that is used commercially is the herring. Herring seldom grow to more than eight inches in length, and are an important food source for many of the animals of the sea. In earlier times, herring were caught for food or as the basis of products like oil or meal. The part of the herring most prized now as food, especially by the Japanese, is the cluster of eggs produced by the female herring, or sac roe. Since Japan can no longer take as many herring as they want in the Gulf of Alaska, they depend on the catches of Alaskan fishermen for this delicacy, and pay good prices for the whole fish. Herring are harvested by seine or gill net during spawning, when they come near shore.

CRAB: Another important resource in Alaska is the crab fishery. There are three kinds of crab used commercially. **King crabs** are the largest crabs in the world, and the most valuable. They are caught from Southeast to the Gulf of Alaska, with the largest fishery being around Kodiak Island. Kodiak is often billed as the king crab capital of the world.

Tanner crabs look a lot like king crabs, but are neither as large nor as valuable. They are marketed as snow crab, and also are fished from Southeast to the Gulf of Alaska. Tanner crabs are often available when king crabs aren't.

Dungeness crabs derive their name from a small coastal fishing town in Washington state. They live along nearly all of the Pacific coast, from California to the beginning of the Gulf of Alaska. Many dungeness crabs are caught in Southeast. They are a smaller crab, with a different taste, and are very numerous.

Pots are used to fish for crabs. Pots are set on the bottom with a buoy and line attached so they can be found and raised. The fisherman lets the pots out and retrieves them later, hopefully filled with crab!

SHRIMP: This is a very profitable fishery in Alaska, especially in the Gulf of Alaska, where pink shrimp are numerous. One of five kinds of commercially caught shrimp, they are the backbone of the shrimp industry. They are usually used as cocktail or salad shrimp. The largest shrimp in Alaska are sometimes called Petersburg shrimp, after the town in southeast Alaska. They are a kind of shrimp called spot shrimp (or spot prawns because of their large size), after the two pairs of white spots on their bodies. Another large shrimp caught in Alaska is the coon stripe shrimp, which has several white stripes on its body. Shrimp are also caught in pots, as are crabs. Because they are much smaller animals, the wire on the pots is a finer mesh.

WHAT ARE SOME NEW TRENDS IN FISH PROCESSING?

Tucked away in a forgotten corner of Kodiak Island is a small, deserted bay called Saltery Cove. On an island in southeast Alaska is another Saltery Cove. Where did they get their names? There were numerous "saltery coves" in the early days of commercial fishing in Alaska. Salting was one method of curing fish in an era without refrigeration or canning. Records on the first salteries began in 1868, the year after Alaska became a U.S. possession. Canning of salmon first began in 1878 at a former saltery in Klawock. Later on, canning became the primary way of preserving salmon, herring, and other fish. Canneries were built whenever there were good runs of salmon. The heyday of canneries was in 1929, when there were 159 canneries throughout Alaska. In 1936, a total of 8,454,348 cases of salmon were canned,

the largest amount ever canned in Alaska. Alaska Geographic's, The Silver Years is excellent if you want to see some great pictures and learn more about the Alaska salmon canning industry.

With the advent of better transportation from and within Alaska, cold storage became a good alternative method of processing fish. Salmon taken from troll boats are flash frozen to maintain the highest quality. The super-cooled freezers preserve salmon quality better than does freezing in the conventional manner. It is easy to get frozen salmon to market since we now have reliable air transportation. Instead of canned salmon, consumers can now eat fresh frozen salmon. Most net-caught salmon is still canned in the usual manner.

Newer fishing boats have their own flash freezing equipment. As soon as the fish are caught, they are frozen, which preserves the fish in much better condition than if they were just iced down in the traditional manner. Herring are flash frozen in sheets. These sheets are then packed in freezer boxes to be shipped to Japan and other markets.

One of the newest advances in fish processing is the making of surimi, a fish paste from which artificial crab legs, scallops, and other mock seafood products are made. Essentially, pollock or other bottomfish are cleaned, then washed and pressed until it becomes a white paste. This paste is then frozen into blocks and sold to manufacturers of these innovative fish products.

To handle the huge numbers of pink salmon, experiments are being done with blocks of salmon that are skinned and boned, then canned into a tuna-like product. The Marine Advisory Programs of the University Cooperative Extension Service are conducting other research as well.

WHERE DOES ALASKA SELL ITS FISH?

While much of the salmon caught in Alaskan waters goes to the Lower 48, the majority of groundfish is sold in Pacific Rim markets. The consumption of fish per person in countries like Japan and Korea is much greater than in the U.S. Oriental consumers buy large amounts of groundfish and most of the sac roe herring, and these markets are expanding daily. With the emphasis on fish as a healthy food however, American consumption is growing. Through the work of the Alaska Seafood Marketing Institute, more and more markets are opening up for fish products of all kinds throughout America. This agency is partially funded by state money, and other money comes from the fishing industry.

HOW DOES COMMERCIAL FISHING AFFECT ALASKANS?

Fishing is a way of life for many Alaskans, who live by the tides, weather, seasons, and commercial fish openings set by the Division of Commercial Fisheries. Since the fishing industry is the largest employer in the state, it has a direct effect on a large number of towns and villages in Alaska. In coastal villages, fishing is often the primary employer.

Other Alaskans obtain work in the fish processing industry. Some of the more important ports for fish processing are Kodiak, Unalaska, and Dutch Harbor. Fish processors often supply tenders to buy fish directly on the fishing grounds. Still other Alaskans fly fish from the fishing grounds to the processors.

Many small businesses such as marine supply stores, marine insurance brokers, and boatyards, are dependant on the commercial fishing industry.

It is easy to see why fishing is big business for Alaska.

HOW DO STATE, FEDERAL, AND INTERNATIONAL REGULATIONS AFFECT ALASKA'S FISHERIES?

We have already mentioned some of the ways in which Alaska's fisheries are regulated. The Alaska State Department of Fish and Game, through the Division of Commercial Fisheries, oversees all of the commercial fishing in Alaska rivers and coastal waters up to 12 miles into the ocean. They use the research conducted by the department biologists to set regulations on the number and type of fish and shellfish to be caught, the places where they can be caught, and the type of gear fishermen may use to catch them.

Beyond the 12-mile limit, out to the 200-mile limit, the waters are governed by the National Marine Fisheries Service, a branch of the U.S. Department of Commerce. They regulate most of the bottomfishing in the Gulf of Alaska. They also are responsible for marine mammals, which are not harvested commercially but sometimes compete with fishermen for fish. Fishermen must abide by rules that prohibit harming or killing marine mammals.

Since halibut appear all along the Pacific coast, rules about halibut fishing are handled by the International Pacific Halibut Commission. This commission has both American and Canadian members. It sets rules on how many halibut can be caught, where and when they can be caught, and the type of gear that can be used.

HOW DOES LIMITED ENTRY AFFECT ALASKA'S FISHERMEN?

Because Alaska has the greatest fishery resource in the world, there are many people who would like to fish in Alaskan waters. Around the turn of the century, fishermen from the Lower 48 began traveling to Alaska to catch fish for the canneries. With no regulations, they soon depleted some fish populations, especially salmon. As salmon runs decreased, it became apparent that limits had to be set to protect them.

For many years, the limit on the salmon harvest helped salmon runs build up again. However, more and more fishermen competed for the available fish, and it became harder for fishermen to make a living.

In 1974, the State of Alaska instituted the **limited entry** program for salmon fishing. Fishermen were given points for the years they had fished and their reliance on fishing for making their living, among other things. Those who had enough points to qualify were given limited entry permits for salmon fishing. The permits specified the type of gear and the area where they were allowed to fish.

With minor changes, this program continues today, and only persons with limited entry permits are allowed to sell salmon commercially. By limiting the numbers of fishermen, those who do fish have more chance to make their living by fishing. It is also easier to control the amount of salmon taken, because the number of fish caught by each fisherman is reported by the buyers to the Division of Commercial Fisheries.

WHAT ARE SOME DISADVANTAGES TO LIMITED ENTRY?

Since 1974 more and more of the permits have left Alaskans' hands. These permits may be bought and sold and depending on the area of the permit, can cost over a hundred thousand dollars. Sometimes a person may have to sell his/her permit due to personal financial hardship. If you think about it, you will discover the system tends to favor those who can afford to pay that kind of money, and many of them don't live in Alaska.

DO WE HAVE MARINE SPECIES WHICH ARE BEING FARMED NOW OR WHICH COULD BE FARMED?

Fish hatcheries have been in existence for many years. The purpose of hatcheries is to make sure that more salmon eggs hatch, and thereby increase the later return of adult fish. The State of Alaska now operates more than a dozen hatcheries around the state. While this isn't farming, it does control one phase in the lives of salmon, and helps ensure that there will be more fish to be harvested commercially.

Another element that could increase the value of the fishing industry in Alaska is the development of **mariculture**, or sea farming. The clean, nutrient-rich waters of our many sheltered bays and inlets are ideal for sea farming operations that could include salmon, shrimp, abalone, black cod, oysters, scallops, mussels, and kelp.

Alaska's mariculture is in its infancy, but there are already a number of oyster farms in the Wrangell area of southeastern Alaska. Research is being conducted on farming other species. Others are proposing salmon farms, which are already operating in Norway and Canada. But before pen-reared salmon are permitted in Alaska, some questions need to be answered.

WHAT ARE SOME ADVANTAGES AND DISADVANTAGES OF MARICULTURE?

The biggest advantage of mariculture is that it can constantly supply fresh products to the market at a competitive price. Other advantages are the number of jobs and small businesses it produces, the greater variety of marine products available, and the good quality of the products.

Alaska is facing increasingly tough competition from Norwegian and Canadian pen-reared salmon. However, Alaska's fishermen are opposed to salmon farming, fearing the competition between farmed fish and the "wild" fish that are the basis of the fishing industry.
Another disadvantage of mariculture is the possibility that diseases may spread throughout a farm population, because they are kept penned closely together, and then infect nearby wild stocks.

There are many questions to be explored and answered before mariculture becomes a dominant force in the Alaskan economy.

TO DO: LEARNING LOG

What do you know now that you did not know before?

What do you still want to know?*

*You could use this for an extension activity or research project.

EXTENSION ACTIVITY 1 2.9

Ocean Research Project

TO DO:

Choose one of the following projects on which to conduct research. Use books, magazines, films, interviews, and field trips to find your information. Report on what you have found with a written report, photo report, audiotape, videotape, posters, or charts.

Here are the ideas you could use:

A. One Alaska Fishery

Become an expert on one of the fisheries we have discussed in the information section (salmon, halibut, bottomfish, shrimp, etc.). You'll need to know about the biology of the species fished, the gear used to catch it, the rules and regulations for harvesting, the processing methods used, the markets, and the overall outlook for this fishery.

B. New Processing Trends

Wouldn't it be neat to learn all about surimi? Or how about flash freezing? What new processing methods are being used for pink salmon? Choose a new technique for processing, and find out more details about it.

C. Fishery Markets

Report on the markets for our fish products. The Alaska Seafood Marketing Institute has lots of information to guide you. Where are the markets expanding? Is ASMI helping to improve Alaska's marketing of ocean products?

D. Your Community and Fisheries

Most communities in Alaska have some relationship with the sea. How do fish affect your community? Is there commercial or subsistence fishing? Is fishing a part of your community's economy? What kinds of fish are harvested? This would be a good project to use photos, videotape, or interviews for your reporting method.

E. Limited Entry

Research the history behind limited entry, and the reasons for its inception. How does it work? How does it affect the fishermen and the fish? What controversy, if any, surrounds limited entry? What do you predict for the future of limited entry? For a good perspective, interviews with fishermen as well as state officials would be good.

F. Bottomfish Regulations

Find out about the agencies and rules that govern groundfishing in the Gulf of Alaska. What is the relationship between groundfishing and Pacific Rim nations and markets? What are joint ventures? What are new market trends for groundfish, and how are they affected by the fishing regulations?

G. Mariculture

Choose one species that is farmed or could be farmed in Alaskan waters. Find out how the farming procedure works. What regulations must be followed? How does the biology of this species affect the farming procedure? Are there people farming this species now? Is it profitable? What are the markets? What are the advantages and disadvantages of this type of sea farm?

H. Salmon Hatcheries

Research the history behind salmon hatcheries in Alaska. Locate the present hatchery sites. How do they work? What is the relationship between salmon hatcheries and the salmon fishermen? Who controls the salmon hatcheries in Alaska? How do legislative decisions affect salmon hatcheries? The Division of Fisheries Rehabilitation, Enhancement, and Development (FRED) of the Alaska Department of Fish and Game is an excellent source for this research project.

EXTENSION ACTIVITY 2 2.9

Alaska's Ocean Resources

TO DO:

This is a good project for the artists or writers among you. Your task is to produce a poster or illustrated booklet that describes as many of our ocean resources as possible.

BEFORE:

First, you'll have to do a little research on all the creatures we've discussed in the information section. Then you'll have to find out what other living resources we have that were not mentioned.

Then decide on the facts you will provide about each animal. Try to choose information that will help people reading your poster or booklet see why this species is commercially valuable.

Choose the format you want to use. Will you hand-write or use the word processor? Will you draw your species, or will you use cut-out pictures or photos you have taken yourself?

DURING:

Here's where you make your poster or booklet. Your audience is your teacher and fellow students, so produce your information for them.

Make your project neat, factual, eye-catching, and interesting.

AFTER:

Write a one-page letter to your teacher, explaining how you researched and completed your project. Describe whether you felt your project was worthwhile, and if you learned anything from it.

EXTENSION ACTIVITY 3 2.9

A Dinner for King Neptune

TO DO:

King Neptune was the mythical king of the sea. He, of course, loved seafood in any way, shape, or form. Your task is to prepare a meal that uses as many Alaskan ocean resources as possible. While it will be "fit for a king," your actual subjects will be your family or class. (This would be a great class project, don't you think?)

BEFORE:

You'll want to research many recipes and available seafood products. What are the traditional seafoods used in your area? Decide whether your meal will be breakfast, lunch, or dinner. Use your imagination to come up with some really original recipes and ideas. Don't forget that you can use only Alaskan seafood! The Alaska Seafood Marketing Institute or the University of Alaska Cooperative Extension Service will be of great help to you, as well as your parent(s) or your home economics teacher.

DURING:

This is the fun part, making and eating the meal. Record your progress on videotape, if at all possible. Don't forget to use centerpieces or decorations from the sea. How about some interviews with your "Neptune subjects," getting their reactions to the meal?

AFTER:

Write or tape a short evaluation of your project. What did you learn about the kinds of Alaskan seafood available to us? What tasted the best? What went over like a lead balloon?

EXTENSION ACTIVITY 4

2.9

Fish Printing

MATERIALS:

Gyo (fish)

a whole fish
watercolor, oil paint, or ink (especially linoleum block printing ink)
rice paper, construction paper, newsprint, or linen
clay
straight pins
paper towels
small paint brush
1/2 inch wide paint brush or small brayer (roller)

Uotsuri (fishing)

Down through the ages, fish have inspired artists and craftsmen. Museums throughout the world have fish art objects and paintings. Here in Alaska, Natives use fish designs in their art.

Japanese fish printing (gyotaku) is a great way for every person to be a successful artist. In Japan, fisherman often do gyotaku (pronounced ghio-ta-koo) as a record of their catch. Fish printing began in Japan or China in the early 1800s, spreading to this country during the present century.

TO DO:

1. Obtain a small whole fish. Maybe you have just caught a fish! Wash it thoroughly using detergent. Rinse and dry the fish to remove all cleanser and any blood or mucus. Place the fish on a good working surface. If your fish is gutted, stuff the body cavity with paper towels. You may want to fill a bag with wet sand and cradle the fish on top of it. Place clay under the fins to hold them out. A pin inserted in the muscular base of one of the first spines of each fin will help keep the fins erect. Stuff part of a paper towel under the gill to sop up excess water.

2. Use a large brush or brayer to apply paint or ink. Stroke consistently from front to back or vice versa so that scales are accentuated. Carefully place a piece of paper over the fish and with your fingers rub gently but firmly over the fish. Remove the paper and hang it up to dry. The eye of the fish can be painted on later with a small paint brush.

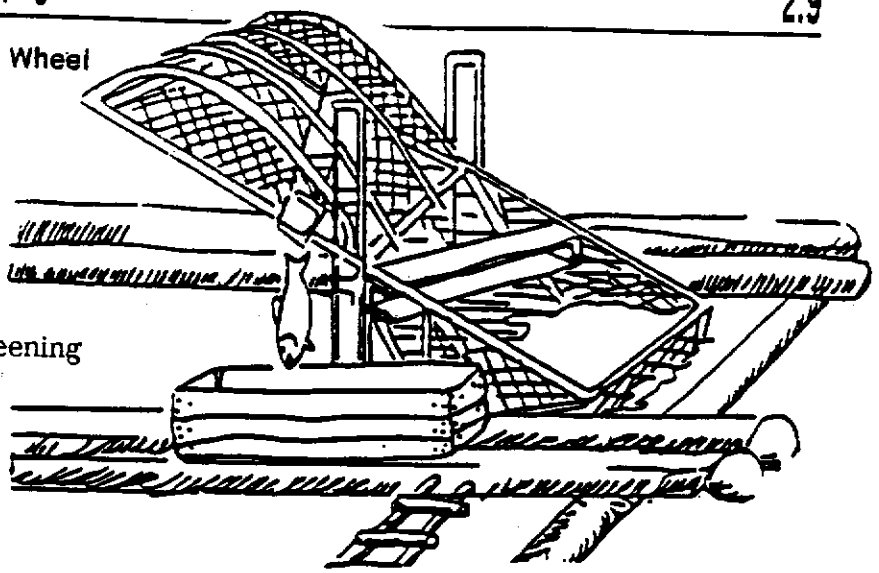
Fish Printing

3. Sign Japanese or Chinese characters. Make a small stamp out of wood, linoleum block, or a half of potato and dip it in red ink. Use a Japanese or Chinese dictionary to figure out which character to use, or use the ones above. When you're carving the stamp, do not forget to carve it backwards so it will print the right way. Then add a cardboard or paper frame to your picture and some yarn on the back to hang it on the wall.

4. Then if the fish is fresh, you can eat it! Just clean and wash it thoroughly.

EXTENSION ACTIVITY 5

Construction of a Fish Wheel



MATERIALS:

sticks
string
glue
small pieces of wood
small nylon window screening
scissors
knife

TO DO:

BEFORE:

The Athabaskans were very clever fishermen, catching fish many different ways (hooks, spears, traps, nets). After 1900, they adopted another method brought to Alaska by people who came up for the Gold Rush. This was the fish wheel which revolutionized Interior Alaskan life because salmon for people and dogs could be caught more easily. People could afford to have enough dogs to run teams and hunt, trap, and travel much greater distances in wintertime. Research the place of fish wheels in the history of Alaska's commercial fishing resource.

The fish wheel is essentially a raft and a paddle-wheel anchored near the bank of a salmon stream or river. The raft, fish scoops, and baskets are made of lashed logs and saplings. Today, nails, bolts, and chickenwire are used. The fish wheel operates entirely by itself, being turned by the river current. There are two paddlewheel fish scoops mounted on a shaft; when one scoop is out of the water, the other is in the river. These scoops (paddlewheels) were designed so that when the river current pushes one up out of the water the other one, on the other side of the shaft, catches the current, thus continuing the rotation. Salmon, swimming upstream to spawn, would swim into the scoops and, as the wheel turned, slide into the sloping fish basket and down into the holding basket. The owner would check the fish wheel several times a day, emptying the holding basket.

DURING:

Make a model fish wheel from the drawing above or other resources and a variety of materials like sticks, string, glue, small pieces of wood, nylon window screening, scissors, and knives. If there is anyone in the community familiar with fish wheels, ask them to help supervise your project. Visit any nearby fish wheels so you can see how closely your model matches the real item.

AFTER:

Now that you have made your fish wheel, demonstrate its use to your family or class, or on videotape. Describe what you've learned about the history and use of fish wheels as you demonstrate it.

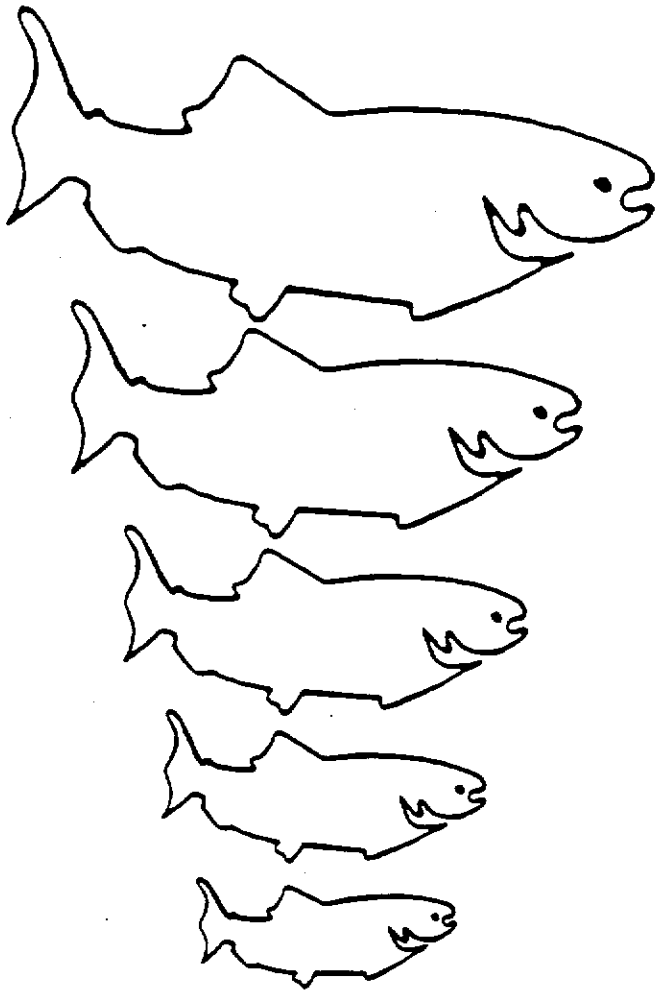
EXTENSION ACTIVITY 6

2.9

Commercial Importance of Salmon

Do some research to find out the species of salmon that provides the most weight of food each year. Put the name of that salmon and the percentage by weight in the largest fish on this page. Then find the second, third, fourth and fifth largest "by weight" salmon, and fill in the respective fish.

Write a short paragraph that discusses the relationship between salmon size and the percentage by weight of salmon provided for food each year.



EXTENSION ACTIVITY 7 — 2.9

An Oceanographer Exploring Alaskan Waters

Comments: You have been selected as a member of an expedition on the famed explorer ship "Calypso." "Calypso" and its famed captain, Jacques Cousteau, will be spending 8 weeks exploring Alaska's ocean waters. Each member has been asked to write an article about their experience. You are an oceanographer. Oceanographers study fish and marine plant life, explore ocean bottoms to discover how they were formed, what they are made of, and what mineral riches they hold. Oceanographers experiment with living beneath the sea; they study ocean waves, currents, and tides; they trace the effects of ocean pollution. Your article may provide an overview of your general reaction to the trip, describing impressions and your job. OR, you may be very specific and focus on one angle of your job and provide reactions and recommendations about Alaskan waters. OR you may create an imaginary interview with Jacques Cousteau about his trip to Alaskan waters to be included in the article.

EXTENSION ACTIVITY 8 — 2.9

An Editorial Concerning Alaska's Waters

Comments: An editorial allows the writer to present a point of view on a specific topic. This type of short essay begins with an opening statement, continues with an explanation of the points raised, and ends with the writer's opinion. Pretend your local newspaper has been featuring articles about Alaskan waters. Several statements have been made for which you would like to provide a response. Write an editorial that gives your opinion on the following question.

Should nations with coastlines have national sovereignty over their territorial waters? If so, how many miles out should territorial waters extend? Should there be any national sovereignty over ocean resources? If not, who should make decisions regarding the development of ocean resources? Who should pay for the development of ocean resources? How can such development take place without threatening the ecological balance?

EXTENSION ACTIVITY 9 2.9

Ocean Options

MATERIALS:

Tape Recorder
Paper and Pencil
Audiotape; Unit 2, Side A

TO DO:

This is a list of the terms that you will define as you are listening to the tape on the fishing industry in Alaska. It might be necessary to listen to the tape a second time to find the required answers.

Fishery
Jurisdiction
Conservation Zone
Take
Harvest Level
Mortality
Optimum Yield
Surplus
200 Mile Limit
Limited Entry
Balance of Trade
State Waters

Essay question - In at least three paragraphs answer the following question. "What is the future of fisheries in Alaska?"

Some of the ideas and views in the taped interviews would be a good foundation for your answers, but don't be afraid to express your own views. Use the glossary of terms that you just finished in your paragraph if it is appropriate.

EXTENSION ACTIVITY 10 2.9

Ecosystems: Oceans

MATERIALS:

VCR and Monitor
Videotape: "Ecosystems Oceans"

BEFORE

List what you believe you will need or want in order to have a "satisfying life." As you watch the program, think of ways that some of the things you listed are provided, directly or indirectly, by the ocean.

DURING

Be sure to jot down any unfamiliar terms you encounter as you watch this videotape.

AFTER

1. Name the major bodies of water that surround Alaska.

2. List one marine animal found in each body of water.

3. Describe the relationship of sunlight to plankton growth and fish populations.

4. Write definitions for the following terms: continential slope, continental shelf, plankton, ocean basin, migration, algae, bacteria.

5. Measure out 2 2/3 cups of unpopped kernels. This is approximately 4,000 kernels, or the number of eggs laid by the female salmon. (a) Write a story about this particular batch of "salmon eggs," eliminating kernels as the salmon in your story die from various causes, or (b) graph a chart which shows percentage of loss and causes. How many kernels will "survive" to spawn?

A Reminder: Be sure to look up any unfamiliar words you noted while watching the program.

Sea School: Five Choices

MATERIALS:

VCR and monitor
Videotape : Choices of "King Crabber", "The Herring Chase", "So The Salmon Will Always Return", "The Halibut Rush", and "Joint Venture."

BEFORE:

What comes to mind when you think of commercial fishing in Alaska? Take three minutes and write down everything that comes to mind in short, one- or two-word descriptions.

Choose at least two of the five video tapes to view.

AFTER:
Complete at least two of the following that relate to the tapes you viewed.

1. Alaska fishermen say that the shellfish industry is in serious trouble. Looking at a graph below, do you agree with that description? If so, why? Write a brief report (3-4 paragraphs) titles, "If I ran Fish and Game..." which suggests methods for regulating the fishing industry and protecting the shellfish populations.

2. Between 1979 and 1981, what would be the difference in the total dollar value of the shellfish catch if we assume prices were:

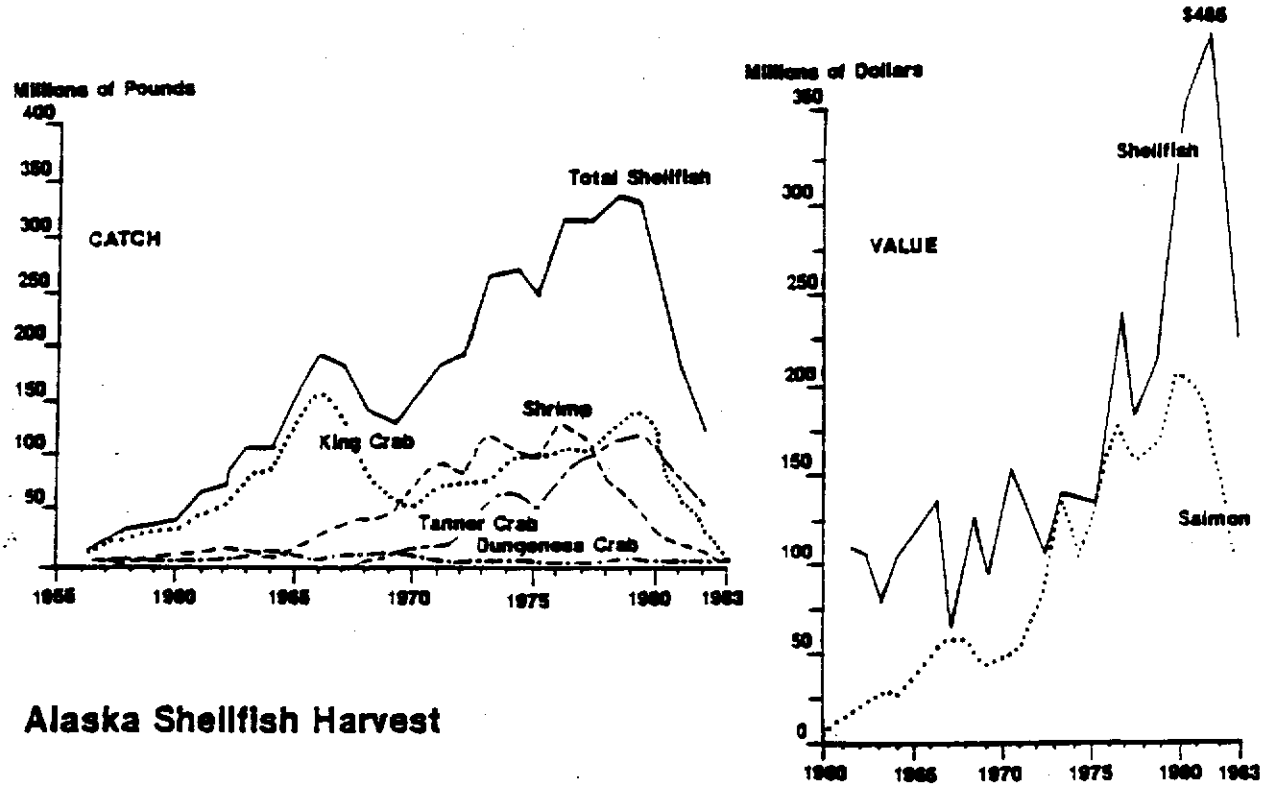
King Crab	$1.00-1.20/lb.
Dungeness Crab	.50/lb
Tanner Crab	.55 - .60 lb
Shrimp	.30/lb

3. Ocean pollution is very real in some tidal communities. What might happen if pollution caused the herring eggs to lose their "stickiness" (adhesiveness); would this affect their lifecycle? The egg survival rate? Increase predation? Kill more roe by tidal action? Give reasons for your answer to each.

4. Find and describe a "target market" that might buy Alaska's salmon. Think up an advertising program and marketing plan for that market.

5. What is the main reason why fisheries managers and biologists might want to know the exact age of salmon returning to Bristol Bay.

6. If there were no management of the Bristol Bay fishery, how long do you think it would take before there were too few sockeye salmon to commercial fish?



Alaska Shellfish Harvest

7. The number of fish in the Bering Sea is incredible. Scientists estimate that two million metric tons could be caught each year without affecting the resource. If you took this yearly bottomfish catch to a party and invited the entire world -- roughly four billion people -- how much fish could you distribute to each person? (one metric ton = 2,200 pounds)

8. Using any map of Alaska, have students estimate to scale how far into the Pacific Ocean and the Bering Sea the 200-mile limit might extend. Remember that the law says "from any coastline as it extends outward," which means islands, peninsulas, archipelagos, and so forth.

9. The hailbut fishermen each had a view of what should be done to relieve the overcrowding of the halibut fishery. What might happen if nothing is done and the IPHC just sets the catch quota? Would this affect the halibut population over the next five years? Would this change (add or reduce) the number of halibut fishermen?

10. What methods have you seen in these progams for catching fish? How are the various types of gear similar? Different? Why so?

11. Everyone has a fish story about "the one that got away." Write your own story to share with your teacher.

EXTENSION ACTIVITY 12 2.9

Surimi

MATERIALS:

VCR and Monitor
Videotape 2 "White Gold: The Alaska Pollock Blues", and "Surimi: An American Opportunity."

TO DO:

As you watch "White Gold: The Alaska Pollock Blues", take brief notes on the process of turning Alaska Pollock into surimi. Then watch "Surimi: An American Opportunity" to learn what makes surimi such an important food resource. Take notes about what it is, why it is made from Alaska Pollock, what Alaska production of pollock is, where surimi originated, the characteristics of surimi, and the growth of the surimi industry. It's fine if you want to watch either film more than once. They are short, and you'll learn much more the second time you watch.

Now that you are an expert on surimi, do the following:

1. Investigate the impact of surimi on your community. Does the gorcery store sell surimi products? What kinds? Are they more affordable than the genuine fish products? Does your community contain fishermen or processors of the surimi industry? Who buys surimi products in your community? Report your findings on tape, either audio or video.

2. Make a poster that advertises surimi as an important Alaskan product while at the same time telling important details about this food.

For extra credit: Contact the Alaska Fisheries Development Foundation to find more about surimi. Report your findings to your class or your Alaska Studies Teachers.

EXTENSION ACTIVITY 13 2.9

Vocabulary Computer Activity

MATERIALS:

Computer
Appleworks
Data Disk #1
Printer (if available)
(If you do not have a printer you will need to send your data disk to your advisory teacher.)

TO DO:

BEFORE:

Load Appleworks and Computer Activity 7 from Data Disk #1 into the computer.

DURING:

Follow the directions on the screen to match the correct terms and definition.

AFTER:

Save the completed file on the disk. Print out a hard copy of the completed activity on the printer.

If you have access to the electronic mail system, you must convert your Appleworks file to an ASCII file. (See Appleworks Reference Manual) Upload your file to the advisory teacher.

ALASKA TRIVIA 2.9

Super Salmon

Did you know?

. . . that at one time, more than 75% of the Territory of Alaska's taxes came from the fishing industry.

. . . that the first salmon cannery was begun in Klawock in 1878.

. . . that fish traps were originally a Native method for catching fish.

. . . that Ketchikan has been known as "The Salmon Capital of the World."

. . . that machines revolutionized the salmon canning process in 1904 by cleaning and trimming the salmon.

Try your own "Did you know" about salmon:

_____

_____

_____

Unit 2, Lesson 10 Using the Land

Here is Lesson 10, which discusses ownership and use of Alaska's land.

It will take you 7 class periods to complete the minimum requirements.

Coming up: Look at the activities in Lesson 13 now to see if you need to order any materials.

Warm-up: Complete this first.	☐ Who Owns the Iditarod Trail? p. 237
Information: Complete this next.	☐ Using the Land p. 240-244
Extension Activities: Complete #10 and at least one more.	☐ 1. My Name is Lars Johnson, writing, p. 245* ☐ 2. Extended Reading, list on p. 236 ☐ 3. My Favorite Alaskan Adventure, writing, p. 245* ☐ 4. Respect the Land, writing, p. 245* ☐ 5. Cattle of the Tundra, p. 246* ☐ 6. Anti-pollution Plan, writing, p. 250* ☐ 7. Arctic Gardening, report, p. 251* ☐ 8. Farming in the 49th, video, p. 255* ☐ 9. Capital Exchange: ANWR, video, p. 256* ☐ 10. ANCSA: Plain and Simple, p. 260* ☐ 11. Using the Land, audio, p. 266* ☐ 12. Tourist, computer, p. 267* *May be sent via e-mail if student has access.
Sourdough Lingo:* Complete this as you study the lesson.	☐ land disposal program Alaska Native Claims Settlement Act Alaska National Interest Lands Conservation Act
Alaska Trivia:* Optional	☐ Alaska's Active Land, p. 268
Assessment:	Keep up to date on your objectives. You will have an assessment after Lesson 11.

Extended Reading List

Lesson 10

The Frontier in Alaska and the Matanuska Colony, O.W. Miller

The Story of a Pioneer, M. Kendler

And the Land Provides, L. Morgan

We Shall Be Remembered, E. Atwood

The Matanuska Colony: Fifty Years 1935-1985, B. Lively

Who Owns America? W.J. Hickel

The Year of the Polar Bear, T.J. Koch

Alaska Bear Tales, L. Kaniut

The Grizzlies of Mount McKinley, A. Murie

The Red Snow: A Story of the Alaskan Gray Wolf, J. Greiner

Tracks in the Wildland, Nelson, Moutner and Baine

RUN THE IDITAROD!!

All set for the race? Place your markers on the starting line at Anchorage. (You can cut out small paper markers and put your initials on them.) Then flip a coin to move ahead—one space for heads and two spaces for tails. Follow the instructions in the space on which you land. One flip per turn, and the first one to the finish line under the old log arch at Nome is the champ.

WARM UP 2.10

The Iditarod Trail

There are four types of land owners in Alaska. The Iditarod Trail crosses land owned by each of these:

* U.S. Government
* State of Alaska
* Alaska Native Corporations
* private individuals

Different land owners have different opinions about what should happen to the trail as it crosses their land. What can be done to make sure that land owners don't block the use of the trail?

In 1979, the Iditarod Trail became one of four National Historic Trails. The National Historic Trail System protects famous trails that are in danger. The Iditarod Trail hasn't changed much since the early day of its use. Today a musher can have a trip to Nome much like the early mushing trips along the trail. The National Historic Trail System will try to protect this quality.

The Bureau of Land Management (BLM) will manage the trail protection plan. Where the trail crosses lands managed by other agencies, those agencies will manage the trail (with BLM's approval). Where the trail crosses privately owned land (like near Knik), or mining claims (like around Iditarod), the U.S. Government will buy 25-foot-wide "easement strips." Buying an easement, in this case, means buying the privilege to use the strip as a race trail or recreation trail.

Before you take off on a long hard race like the Iditarod, it's a good idea to study a map first. Check out the legend and the scale of miles in the lower lefthand corner and line yourself up with the compass rose. Then:

1. On this race you will run between two major bodies of water along Alaska's coastline from _____ on the east to _____ in the west.

2. The route through Interior Alaska alternates each year. Since 1983 is an ___-numbered year, it will follow the _____ route.

3. Using the scale of miles, figure out which checkpoints on the trail are the farthest apart. _____ and _____
4. You figure if you average about 75 miles a day, you can reach Nome in about two weeks. That means you'll want to make it from Settlers Bay to _____ on the first day.

5. At that rate, with luck and good weather at the other end of the line, it will take you between _____ and _____ days to travel along the shores of Norton Sound from Unalakleet to the finish line at Nome.

map and game on next page

OBJECTIVES 2.10

Using the Land

Here's what you will be studying in Lesson 10. Upon completion, you should be able to answer these questions:

- What was the traditional and customary Native use of land?
- How is the land of cultural value to Native Alaskans?
- Who owns Alaska's land?
- How does Alaskan land ownership compare with ownership in other states?
- What are three ways Alaskans use their land resources?
- How do Alaska's land policies and usage affect the Alaskan population?
- How is Alaska increasing the agricultural potential of the state?
- What are Alaska's land disposal policies?
- What is the impact of state and federal regulation on Alaska's land use?
- What are some of Alaska's major tourist attractions?
- How does the state of Alaska promote tourism?
- What are some positive and negative effects of the increase in tourism in Alaska?
- Can you name at least three types of businesses that are dependent on tourism?

Using the Land

WHAT WAS THE TRADITIONAL AND CUSTOMARY NATIVE USE OF THE LAND?

In spite of their cultural differences, early Native Alaskans had many things in common. They were hunters and gatherers and had no agriculture. Even though they travelled over large areas, the tribes were not nomadic. Almost all of them had permanent dwellings in established villages. They would travel to their summer camps to harvest various plants and animals, and they would sometimes travel to other areas to trade, but they would always return to their permanent village.

Each tribe had established boundary lines. They used various parts of their lands in similar ways season after season. Sometimes they would travel to lands of other tribes if they had kinship ties or alliances. However, in some Native tribes, if a stranger appeared on their land without a good reason, that was the end of that person!

HOW IS THE LAND OF CULTURAL VALUE TO NATIVE ALASKANS?

Native Alaskans saw the land, rivers, and sea as having bountiful resources that met all their needs. Respect for the land and its inhabitants was fundamental to all aspects of tribal life. People showed this respect by the generous sharing of food, clothing, and gifts among families and friends. They honored the animals and plants they harvested by their special customs and traditions of hunting, fishing, gathering, and preparing food.

WHO OWNS ALASKA'S LAND?

With the arrival of the Russians, the Native system of land use was changed. The Russians relocated many Aleut people when they pressed them into hunting sea otters. They established forts and trading posts on land previously used by the Natives. Although the Russians had never explored much of Alaska's vast interior, they claimed all of Alaska, and sold all of it to the United States.

The Americans took over, slightly embarrassed over the purchase of such a "worthless" piece of property. Through all of these exchanges, no one ever asked the Alaska Natives about the land they had claimed and used for centuries. Most of the lands of Alaska remained in the hands of the federal government until Statehood, when some land was transferred to the State of Alaska.

It wasn't until the discovery of oil in the 1960s that Native rights to land surfaced. These rights were addressed with the passage of the **Alaska Native Claims Settlement Act** in 1971. Read more about the history of Alaska's lands now in the Alaska Almanac by studying the first section of "Land" down to the part about acquiring land for private use. Pay special attention to the chart that shows amounts of land and ownership. You can also read the same selection on pp. 130-131 of PGA.

HOW DOES ALASKAN LAND OWNERSHIP COMPARE WITH OWNERSHIP IN OTHER STATES?

One of the problems faced by the people of Alaska is the relatively small amount of land that the state and private individuals control. Even after the selections by the state and Native corporations, the federal government still controls 70 percent of Alaska's 365 million acres. Federal lands are controlled by agencies such as the Bureau of Land Management, U.S. Forest Service, and U.S. Park Service for use of all U.S. citizens.

Many of the western states are also controlled in large part by the federal government. For instance, 86 percent of Nevada, 66 percent of Utah, and 63 percent of Idaho are owned by the federal government. Contrast this ownership with

Texas, where less than 2 percent is in the hands of the government, or New York, where less than 1 percent is owned by the federal government. It is easy to hunt, for instance, in Alaska, since much of the federal and state land is open for hunting. However, if you were in Texas, where almost none of the land is federal land, you could not hunt unless you owned your own land to hunt on, or you had permission to hunt on someone else's land.

WHAT ARE THREE WAYS ALASKANS USE THEIR LAND RESOURCES?

Of course, like residents in all other states, Alaskans use land for homes, businesses, industries, and cities. However, less than 1 percent of the land is used for these purposes in Alaska. Alaskans develop the land's resources, like timber and minerals. (Timber and minerals will be discussed in other lessons.) Alaskans also use the land for agriculture, trapping and hunting, subsistence food gathering, parks, refuges and wildlife habitat, public recreation, and wilderness and tourist experiences.

Alaska has a wealth of wildlife, including many species that are rare elsewhere: grizzlies, bald eagles, polar bears, wolves, caribou, peregrine falcons, Dall sheep, and Arctic fox, to name a few.

One method of harvesting wildlife is by trapping. Read about trapping in PGA, page 147, "Furs and Trapping." Then read about the fur bearers themselves on the section called "Mammals" on pages 157-158.

Hunting has changed in Alaska since the coming of non-Natives. The traditional Native use for wildlife was for feeding their families. The occupation of a Native man was "hunter." Now that there are many ways Alaskans make their living, people use the money they make to buy food for their families. Hunting has become a sport for some and not a principal occupation. Sportsmen from all over the world come to hunt here. The Alaska Board of Game regulates hunting in Alaska. Read about how hunting is controlled in the section called "Hunting" in your Alaska Almanac.

Now read the section called "Subsistence" in your Alaska Almanac. You will see that subsistence use of fish and game has the highest priority for use in Alaska. This protects the traditional rights of Natives to use the resources of the land, and also allows others who live in rural areas to gather animal and plant resources to feed their families. In earlier times, subsistence rights were reserved for persons of Native blood. Recent rulings determined that a person's subsistence rights now depend on where they live, in an urban or rural area of the state. Subsistence continues to be a hot issue in Alaska, since it directly affects both the people and the wildlife of the state. How do you think the subsistence issue should be solved?

One of the greatest treasures of Alaska's land resources is its emptiness. This is something rare in other parts of America. One can still get out into true wilderness relatively easily in Alaska. To protect this wilderness, the federal and state governments have established parks, preserves, and wildlife refuges. You can find out about some of the features of Alaska's land by reading pp. 132-136 in PGA. Now read about the **Alaska National Interest Lands and Conservation Act** on pp. 176-182, beginning with National Forests. Also, The State of Alaska has established a park system to help residents and tourists enjoy the land. Read about this system on pp. 184-185 in PGA. Also see your Almanac, under "Land."

HOW IS ALASKA INCREASING THE AGRICULTURAL POTENTIAL OF THE STATE?

Another use of Alaska's land is agriculture. Alaska holds the distinction of being the largest state in the union--with the smallest area in agriculture. Read about the patterns of agriculture use on pp. 150-151 of PGA.

Alaska has 20.5 million acres of land that have agricultural potential, although much of this potential is reserved for reindeer grazing.

The state has regularly held agricultural land sales to encourage more locally grown food as well as to provide more industry and jobs. A sale for dairy farm development was held in the Point MacKenzie area across Cook Inlet from Anchorage. The 15,000-acre area now has several dairy farms, which grow both cattle and the feed for them.

State and federal agencies help these farms get started by finding good land, providing loans, and studying the market for farm products.

International markets are developing for Alaskan agricultural products. A grain elevator has been built in Valdez so the Delta barley farmers can sell their crop to the other Pacific Rim countries. However, a local market for barley exists also. Much of the barley is now being sold within the state to dairy farmers. A very successful product on the international market is reindeer meat and horns. (See PGA pp. 102-103 and p. 126.)

HOW DO ALASKA'S LAND POLICIES AND USAGE AFFECT THE ALASKAN POPULATION?

We have discussed the ways Alaska preserves land for use of all citizens through its park system. The Alaska Department of Natural Resources (DNR) regularly makes state land available for private ownership to Alaskans through the lottery, homesite, homestead, and public auction programs. This is opening up outlying areas of the state. At last, Alaskans can have a place of their own in a variety of settings.

One land disposal program previously mentioned was the Point MacKenzie agricultural land disposal, offered in 1983. Almost no one lived in this wilderness area of the Matanuska-Susitna Borough before. The many families now owning or working on the dairy farms there have greatly increased the population. They need schools, roads, stores, telephones, and other services. How does that affect the Mat-Su Borough? What should these new residents do to get the services they need? What about the animals and plants that previously existed undisturbed in this area? These are a few of the questions that must be answered about the effects of the land disposal program.

WHAT ARE ALASKA'S LAND DISPOSAL POLICIES?

Persons must be at least 18 years old and Alaska residents for at least one year to acquire land through these programs, except for auctions. For auctions, anyone over 18 can bid.

DNR usually holds one major land disposal offering each year. The offering can be a mixture of land programs. Interested individuals file applications to purchase the land, and where more than one person has filed for the same parcel of land, a drawing is held to determine the winner. If land is not awarded through the land disposal, it may be sold over the counter at local DNR offices.

WHAT IS THE IMPACT OF STATE AND FEDERAL REGULATION ON ALASKA'S LAND USE?

We have discussed and read about some state and federal regulations that affect the lands of Alaska. Most of these regulations govern the uses of the state parks and forests and the national interest lands, like parks, preserves, monuments, wild and scenic rivers, wilderness areas, and wildlife refuges. Since these lands belong to all of the citizens of Alaska or the United States, the guidelines are set up to preserve and protect the land from unwise use.

Other regulations that affect Alaska's land are the local, state, and federal

regulations that govern how private land may be used and developed. These regulations are usually more evident and important near larger villages and towns, since large concentrations of people living in an area tend to affect the area more.

For example, the Alaska Department of Environmental Conservation (DEC) requires individuals and communities to adhere to certain standards for things like water and air quality and disposal of wastes. The U.S. Corps of Engineers regulates the kinds of building that can go up near bodies of water and in wetlands. Many boroughs in Alaska have land use plans, which divide the borough into zones where certain activities can take place. For instance, some areas of a town may be reserved for homes while other areas are reserved for businesses.

WHAT ARE SOME OF ALASKA'S MAJOR TOURIST ATTRACTIONS?

> "Certainly our tourism has worldwide implications. It's growing substantially each year, and one of the reasons is that we do have some remaining untouched wilderness. One of the major reasons people come up here is that they look at Alaska as a unique experience that they can't get anywhere else."
>
> Jay Hammond (1979)

Former Governor Hammond spoke of the major tourist attraction we have--the untouched wilderness. The solitude and beauty of Alaska's landscapes touch the imagination of many who can't find this near their own homes. Some only go to the edge of the wilderness by taking cruise ship or tour bus trips, but they still catch the flavor of wild places.

There are other attractions that draw tourists from all over the world. Native life in parts of Alaska has not been substantially affected by civilization and this has been and continues to be a tourist draw. Some Native villages have turned this into a business, by providing examples of their village culture. Many tourists like to report that they have journeyed above the Arctic circle into the legendary "land of the midnight sun." Some tourists come to see geologic forces like glaciers and volcanoes at work, while others want to catch glimpses of our abundant wildlife.

Observing remains of the "sourdough" lifestyle is important to many tourists. They pan for gold, mush dogs, or run rivers to feel that they, too, have taken part in frontier American life. For others, the chance to view Denali is the essential part of their trip north. The peak is also an international magnet for climbers.

HOW DOES THE STATE OF ALASKA PROMOTE TOURISM?

Tourism employs a substantial number of people, brings money into our state, and is growing every year. To promote tourism even further, the State of Alaska has a Division of Tourism that coordinates many different kinds of advertisements to draw visitors to Alaska. Alaska spent $6.3 million dollars on tourism promotion in 1986. That money buys generic advertising on national and regional television and 30 magazines around the country.

The Alaska Visitors Association is another group that promotes tourism within Alaska. Many of its 700 members work in the tourist industry. This association and others like it promote tourism in Alaska.

WHAT ARE SOME POSITIVE AND NEGATIVE EFFECTS OF THE INCREASE IN TOURISM IN ALASKA?

The greatest positive effect of increased tourism is, of course, the jobs and money it brings to the areas being visited. Tourism is one industry that is relatively "clean," environmentally speaking. It does not produce industrial wastes like factory sludge, impure air, or phosphate-filled streams. Another positive effect of tourism is the feeling that the visitors

develop for the land of Alaska. They are interested in preserving its wildness just as many residents are.

One negative effect of tourism is the irreversible change it brings to some previously unspoiled areas or to some groups of people.

CAN YOU NAME AT LEAST THREE TYPES OF BUSINESSES THAT ARE DEPENDENT ON TOURISM?

Tourism is BIG BUSINESS. In 1986 it accounted for $700 million spent within our state. The money the tourists spend goes directly to the many businesses that cater to tourists, including the transportation and hotel industries. Tourists spend money in grocery stores, at service stations, in restaurants, gift shops, and beauty salons. In 1986, tourist dollars directly supported about 19,000 jobs and indirectly supported another 38,000 jobs, about one of four private sector jobs in the state, according to the Division of Tourism.

Tourist businesses are many. Tours on ships, buses, helicopters, trains, and airplanes visit many of the favored spots in Alaska. Lodges offer photography expeditions, hunts, fishing trips, and just plain wilderness enjoyment. Charter fishing and hunting trips are popular with many tourists. There are even restaurants that adopt Alaskan themes to entice tourists.

We have discussed many aspects of our land resources in Alaska. We know that the major landowners, from large to small, are the federal government, the state government, the Native corporations, and private individuals. Much of Alaska's land is held for use by all citizens, and there are rules and regulations to govern that use. Other land is developed as resources, or is used by private individuals, either for their homes or some type of business. One industry that directly relates to the beauty of our land is tourism. The lands of Alaska are important to all Alaskans, and it is wise to care for them.

TO DO: LEARNING LOG

What do you know now that you did not know before?

What do you still want to know? *

* You could use this for an extension activity or research project.

EXTENSION ACTIVITY 1 — 2.10

My Name Is Lars Johnsen

Comments: Lars Johnsen is a second generation American. His parents immigrated from Scandinavia. It is March, 1935. Lars' family lives in Wisconsin and has been hurt by the Depression. They are farmers. The State Emergency Relief Administration in Minnesota, Wisconsin, and Michigan has been sending out social workers to select families who might be sent to a relocation project in the far-off lands of Alaska. One of the selection criteria is that the people need experience farming in a cool climate. The project is one of President Franklin Roosevelt's first relief programs for the thousands of families suffering due to the economic times. This program also presents a chance to demonstrate Alaska's agricultural potential. Lars is fortunate; he and his family are selected to farm as part of the Matanuska Valley Project.

Become Lars Johnsen and tell what it was like to move from the midwest to Alaska in the 1930's. Talk about the crops grown, cost and availability of clothes, housing conditions, and their failures and successes that first year.

EXTENSION ACTIVITY 3 — 2.10

My Favorite Alaskan Adventure

Comments: Describe a fun, adventurous, scenic, and/or impressionable experience you have had while living in Alaska. Consider that your tale could be used to "encourage or discourage" visitors to our state. Provide detail and sensual descriptions so the reader feels he is right there with you!

Remember, too, the topic of this lesson; Using the land.

EXTENSION ACTIVITY 4 — 2.10

Respect the Land

Comments: Read an Alaskan Native legend or story that demonstrates traditional use and cultural value of the land. Capture the message the legend is trying to convey by writing a short summary. (Follow the format on page 34 of the Teacher's Guide.)

EXTENSION ACTIVITY 5 2.10

Cattle of the Tundra

TO DO:

Read the article about reindeer below and try at least one of these:

1. Make a poster that shows as many pertinent facts about reindeer and the reindeer industry as possible. Make it colorful and interesting.

2. Interview someone who is involved in some way with Alaska's reindeer industry. It could be a herder, owner, Fish and Game employee, or an expert of some kind. Write your own report on the importance of the reindeer industry to Alaska.

CATTLE OF THE TUNDRA

Reindeer herding is probably the oldest agricultural industry in Alaska. True, that's not very old. The word "agriculture" simply means the act of raising the crops and livestock you need. But until the coming of outsiders about 200 years ago, Alaska's Native people had lived by taking their food where they found it. They were hunters, not herders, and gatherers, not growers.

But even nature has its cycles. Seasons vary and patterns shift. In the late 1800s, just as the country was beginning to fill up with miners, fur traders, and whalers, the great wild caribou herds on which the people depended all but disappeared from northwestern Alaska. And it seemed like a good time to try raising an animal you could control--a source of food you could count on. So a small number of reindeer, which are domesticated caribou, were brought over from Siberia where the Chukchi Eskimos had been raising them successfully for many years.

THE STORY OF ALASKA'S REINDEER

The idea of bringing in reindeer to replace the absent caribou really made sense. Basically they are the same animal. Only in North America is the name "caribou" (an Algonquin Indian word) used for the untamed branch of the family. Both are called reindeer in other polar regions of the world, with the term "wild reindeer" used for the animals that still run free.

They look alike, except that domestic reindeer may be a little smaller and lighter in color. They often join each other's herds and breed together. They graze the same wide-open tundra range and eat the same food.

Cattle of the Tundra

What's more, reindeer meat is as tasty as caribou--even a little better. The hides are as useful--an important item for Alaska's Native people who relied heavily on the caribou for tents, blankets, clothes, parkas and mukluks. And reindeer become very gentle when tended in herds. They can be taught to pull sleds and carry packs. They can run as fast as horses for short distances. And if you put your mind to it, you can even break one to the saddle.

In 1892 about 170 reindeer were unloaded at Port Clarence on the Seward Peninsula where the Teller mission school was hastily enlarged to become the Teller Reindeer Station.

Later, herders from Lapland in northern Scandinavia, where reindeer are the main source for subsistence food and clothing, were brought in to teach the Eskimos to herd reindeer. The Lapps felt right at home in Arctic Alaska.

The Lapps were paid a yearly salary, plus all the reindeer they needed, and at the end of their contracts were given small herds of their own. The Eskimos were required to train as apprentices for as much as five years before they could start their own herds.

Meanwhile, the center of all this attention--the reindeer--were certainly doing their part. They were multiplying like rabbits. When the Russian government put a stop to the reindeer shipments in 1902, the 1,280 animals brought into Alaska had increased on their own to 5,184. Most reindeer are mature and able to breed when they are two years old or even younger. And some of the herds were growing at the amazing rate of one-third a year.

By 1910 reindeer populations had soared to nearly 150,000. About 60 percent were owned by Native herders, who had finally come into their own with the help of the newly established U.S. Reindeer Service. The rest were controlled by Lapp herders, private owners, and mission schools scattered from Barrow to the old Carmel Mission near Dillingham on Bristol Bay.

But the hub of the action was the Seward Peninsula, which was beginning to look like Santa Claus country. The gold rush to the beaches of Nome had brought thousands of prospectors into the area and a ready market for reindeer meat. Reindeer hitched up to sleighs hauled mail, passengers, supplies, and freight to outlying gold camps. And the high point of the social season were the reindeer fairs, complete with reindeer races, roundups, parades, and competition in herding skills.

Even after the gold boom faded and prospectors drifted away, raising reindeer seemed like a very promising business for those who were looking around for something else to do. It drew the attention of pioneer attorney J.G. Lomen and his sons who owned several stores in Nome, along with a freighting outfit and some trading posts on the Seward Peninsula.

Cattle of the Tundra

In 1914 the Lomens bought their first herds and slowly began to build a reindeer empire. They ignored the local market for reindeer meat (what there was left of it--which wasn't much) and set about selling their product to the rest of the nation.
They put on an advertising blitz that could match today's prime-time TV commercials. They staged an imaginary reindeer drive "all the way from the North Pole" to supply stateside department store Santas with live reindeer at Christmastime. They pushed reindeer meat as a luxury food "better than beef" and soon had it featured in fine restaurants from coast to coast and even on transcontinental railroads.

At its peak in the 1920's, the Lomen company shipped more than six million pounds of reindeer meat to Outside markets. Eskimos were hired to herd and butcher the family's vast reindeer holdings. The meat was placed in a huge underground cold storage plant built by the Lomens in natural ice deposits at Elephant Point south of Kotzebue. And then it was shipped south through Seattle aboard the family's new steamship line.

But the early 1930's marked the beginning of the end of the reindeer boom--not just for the industry but for the animals as well. By that time more than half a million reindeer roamed Northwest Alaska, the big caribou herds were moving back as well, and the fragile tundra range simply couldn't support them all. There were bitter arguments over grazing rights, and charges that strays and unmarked calves were being illegally branded into the Lomen herds.

Although the Native people now owned the great majority of the reindeer, they didn't much like the idea of one company making a fortune out of the animals that were supposed to have been brought to Alaska for Native use. So in 1937 Congress passed the Reindeer Act which allowed only Natives to own Alaska reindeer and provided funds for the purchase of all reindeer owned by non-Natives.

But by that time it was all over anyway. The Great Depression had knocked the bottom out of the luxury meat market in the States. Several severe winters in a row had cut deeply into the size of the herds. Wolves, bears, and other predators took their toll on the weakened animals. And in 1939, when the Lomen firm went out of business, reindeer populations were in the midst of a plunge from which they would never recover.

Today the reindeer are slowly increasing again, although it's hard to get an accurate count. Most of the big herds on the Seward Peninsula are tended loosely if at all, except during roundup time. More reindeer are joining the migrating caribou than herds owners care to think about. And the size of the few scattered survivor herds left on the islands from the hey-days of the 1930s is anybody's guess. So reindeer populations estimates vary wildly from a top of 38,000 to a mere 25,000.

Cattle of the Tundra

The industry is coming back, too--nothing like the multi-million-dollar Lomen empire, but enough to make reindeer herding worthwhile. Putting a dollar value on today's reindeer industry is almost impossible because labor is often paid off in meat instead of cash, and most of the animals are used for subsistence. Still it ranks high among Alaska's young agricultural industries. Some say it is second only to the state's top money-maker which is greenhouse production, of all things (fresh flowers, vegetables, bedding plants and forest seedlings). And it's well ahead of dairy farming and field crops like barley.

Most of the profits from the reindeer industry come from the sale of velvet-covered antlers to South Korea, China, and other Oriental markets where they are highly prized as medicines. The antlers, which are dried and powdered, bring $12 to $45 a pound and average about 2 1/2 to 3 pounds per reindeer. They are painlessly cut from the animal's head early each summer and, of course, are obligingly grown back the next year. Fresh reindeer meat sells for around $1.75 wholesale, and considerably more than that in Nome and Kotzebue butcher shops where people stand in line to buy it. Kotzebue butcher shops where people stand in line to buy it.

But the industry has a long way to go. The slaughtering is still done in the field and there is no inspected slaughter facility. Without such a facility there can be no state or federal grading. And without the grading system, no fresh meat can be shipped south of the Yukon River to the big population centers of Anchorage and Fairbanks or to markets outside Alaska.

The industry is doing its best to modernize and keep pace with the times. In 1976 the Northwest Alaska Native Association's regional corporation, which has had much success with its investments, bought 800 reindeer from the model herd at the Nome experimental station. It was another of those times when caribou were scarce, and the main idea was to provide food and jobs for the people of the area.

Today the herd has grown to 4,000 (not counting the 2,000 that were lost to the caribou this year alone) and is the largest in Alaska. A butcher shop has been built in the basement of NANA's hotel in Kotzebue. The herd is more closely tended than most, using a combination of new and old techniques--from spotter planes and snowmachines to old-fashioned reindeer (sheep) dogs to help the herders.

REINDEER AND CARIBOU

Scientifically speaking, reindeer and caribou have the same name--Rangifer tarandus. Their main claim to fame is that they are the only member of the deer family in which the females grow antlers as well as the males (see Alaska Earthlines/Tidelines, October, 1982). And beautiful antlers they are, with tall graceful antlers soaring up and to the sides and an odd flat secondary set which grows straight out in front of their faces. Antlers are shed in the winter or spring and regrown early each summer.

EXTENSION ACTIVITY 5 (continued) 2.10

Cattle of the Tundra

They travel in herds, ranging in size from small groups to tens of thousands which spread out across the tundra as far as you can see. And they are constantly on the move, pausing only to rest and feed on grasses, low shrubs, willow and birch in the summer and lichens or dried sedges in the winter. Migration routes may change as they leave over-grazed ranges to seek out new ones, but cows return each year to the same calving grounds.

Wolves, bears, wolverines and even the ravens, which prey upon the calves, are their natural enemies. But in the summertime, the herds are often bothered even more by pesky mosquitoes and black flies which may send them into a wild stampede.

Both reindeer and caribou are built to travel. Their large hooves are round like pancakes--hard on the outside so they can dig down through the snow after food, and spongy-tough in the center to give them good footing over ice, snow and marshy tundra. Their big feet also make good paddles as they swim across rivers and lakes, and their thick fur is filled with air so that they float high in the water with nearly a third of their bodies above the surface.

The only sure way to tell reindeer from caribou is by their manners. The reindeer are tame and gentle after centuries of herding, while the caribou still roam wild and free. And while there may be small differences in their appearance, scientists say these probably came about through domestic breeding.

EXTENSION ACTIVITY 6 2.10

"Anti-pollution Plan"

Comments: Some environmentalists charge that our desire to "conquer nature" causes pollution. You have been hired by your local government to evaluate the pollution in your area. Your instructions are to identify existing pollution or potential trouble spots and make recommendations to the council on how this pollution could be eliminated or made less.

EXTENSION ACTIVITY 7 2.10

Arctic Gardening

TO DO:

Read the following article about one man's efforts to introduce agriculture, in a limited scale, to the Arctic. Then conduct your own research into the agricultural activities that take place in your area. Can you gather statistics or conduct interviews? Be sure to contact the Cooperation Extension Service in your area for information. What potential does your area have for agriculture that is not being reached at this time? What could improve agriculture in your area?

Report your findings in any method that you wish.

ARCTIC GARDENING by Tony Schuerch
We Inupiat are traditionally hunters and fishermen, not farmers. There is no evidence that our people ever cultivated crops before the coming of the white man. The closest the Inupiat ever came to that was gathering wild edible plants. It came as a surprise to many people to learn that even the most traditional of our villagers are accepting gardening with such enthusiasm. Still, it should not have been surprising. As one elderly villager told me, "All my life I have to travel to get food. Now I just get it by my house."

The story of gardening among our people began with the coming of the first white men who settled here near the turn of the century. Miners, missionaries, teachers, and traders often brought seeds with them to plant in the summer. Our people were fascinated, and very soon were gardening themselves. Some of these early gardens were quite successful. But most of the white people were transient, and soon moved on. Eskimo gardeners, meanwhile, did not have the knowledge and experience to know what to do when they encountered problems. For example, few of them understood the need for continued fertilization. They watched their crop yields diminish yearly as they continued to garden on the same plot, until eventually it was no longer worth the time and effort to plant a garden. Chemical fertilizer was unknown. Organic fertilization was vaguely understood, but since the ground is frozen for eight months each year, composting can only take place during the short summer season.

Some of these early gardeners learned they could get better crops if they relocated their gardens every few years. But cultivating new ground in the tundra sod by hand is a backbreaking task. Tundra topsoil is usually peat, which in its undisturbed state lies in rubbery layers matted together. One disgruntled gardener compared his ground-breaking efforts to "trying to pulverize wet moosehide with a shovel."

Arctic Gardening

As a child growing up in Kiana, I observed quite a number of families raising gardens. But when I returned home with my family in summer 1976, there were probably fewer than eight Native families growing gardens in the entire region. Nearly all of these were older people whose efforts were not being noticed or copied by the younger generation.

My wife and children and I had gardened down south, both to supplement our food requirements and for recreation. We were amazed at how easy and enjoyable gardening could be if one had the latest equipment and materials. We determined to try gardening when we returned to the Arctic.

In Kotzebue I began trying to gather information on gardening in the Arctic. Although Alaska agriculture was being promoted at the time, virtually nothing had been researched on agriculture in the Arctic. While visiting Fairbanks on business one day, I went to the Cooperative Extension Service offices to get some help. There someone gave me the name of Muktuk Marston as a possible funding source for an arctic gardening project. Marston, as the organizer of the Alaska Territorial Guard, was a living legend in Alaska. He had spent years pursuing a dream of getting his Eskimo friends to garden and farm, with very little success. I wrote to him asking if he would be interested in funding a small experimental project in village gardening. Marston had his wife Elsie respond favorably to my letter, and soon we had $5,500.

Soon after, I contacted Native leaders in three Kobuk villages to try to get some interest. One person responded, Art Douglas of Ambler. He invited me to bring the project to the village and promised local support.

In June 1977 my son Matt and I arrived in Ambler with a load of fertilizer, fencing, seed, bedding plants, a new power tiller, and all our camping gear. At first we felt some misgiving, wondering how we would feel if things did not work out. But we need not have worried. Ambler people welcomed us, and allowed us to try out the tiller on their proposed garden spots. We were all surprised and delighted at the speed and ease with which the tiller made pulverized seedbed out of tundra sod. The people had never seen chemical fertilizer before either, and expressed some misgiving about it. They did spread the fertilizer on their gardens, however.

Gardening seemed to become a family activity, involving both men and women. I had been afraid that the men who took great pride in their ability as hunters would consider gardening to be demeaning. But to my surprise the most successful and renowned hunters became the most successful and enthusiastic gardeners. It was they who asked the most questions, and were most concerned about getting maximum production. Only later did I realize how closely related subsistence living is to gardening. In fact, villagers often refer to gardening as subsistence farming.

Arctic Gardening

Successes at Ambler gave us the confidence to expand the project to other villages, and since then it has been difficult to keep up with the interest and demand from other villages for a gardening project. The first year in Ambler we saw about 25 gardens. The second year we expanded the project to include ten villages which produced about 250 gardens. The third year the project served 25 villages and produced about 550 gardens. In summer 1980, the project was in 35 communities from Naknek to Noatak, in four regions of western Alaska. Between 700 and 800 gardens were grown.

Although more than 95 percent of the Native gardeners had never gardened before, they were nearly all successful. Nearly all vegetable varieties did well. People grew beets, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, celery, chives, collards, kale, kohlrabi, head and leaf lettuce, mustard greens, onions from sets, parsnips, peas, potatoes, radishes, rhubarb, summer squash, swiss chard, and turnips. In addition to vegetables, Eskimo women show a high interest in growing flowers. Certain varieties do very well in the Arctic.

The gardening project is really more an effort than it is a program. It has no full-time professionals, and is aimed at simply making things easier for those who want to garden. Through the Marston Foundation and Brigham Young University, tillers, seeds, fencing, and fertilizer are donated for the use of each village. Wherever possible, the people are asked to buy seeds and fertilizer at cost to encourage self-reliance and independence. Village gardeners do best when someone is available to visit them in the early spring to tune up and make repairs on the village tiller, bring in new seed supplies, and hold a community meeting to teach and motivate the would be gardeners. Gardening is still new enough so that most families need some encouragement to get started. Always, we encourage the gardeners to experiment with new methods and new varieties. Arctic gardening is new enough so that there are no real experts in it yet, and we all are learning together. Every year some enterprising gardener discovers something that we did not know before.

Perhaps one of the most humbling experiences came that first summer in Ambler, when I had brought Dr. Curtis Dearborn, research horticulturist, into Ambler to evaluate our crops. Earlier in the year we had told the people not to bother trying to grow tomatoes, as it could not be done without a greenhouse. Walking beside the home of one of the gardeners, Dr. Dearborn remarked on the fine looking tomato plants in Ike Douglas's front yard. I told him I didn't know Ike had planted tomatoes. Later, when we saw Ike, he denied planting any tomatoes. Dr. Dearborn then directed us to three tomato plants nearly overgrown with weeds, one of which had ripe fruit on it. While all three of us stood there wondering how they got there, Ike's wife came out of the house and asked us what could be so interesting in the area where she dumped her kitchen garbage scraps. Those wild tomato plants reminded us of how little we know about just what the limits are of arctic gardening.

Arctic Gardening

Of course, with this amount of interest and activity in gardening, there were bound to be a few foresighted and outstanding individuals who began to envision long-range social and economic development opportunities. Grant Ballot is one of these. A talented and energetic young leader from Selawik, he envisioned the development of farming there. But since Selawik is located in a swampy area, he and other local Native leaders decided to develop an agricultural site 15 miles north, on the south slope of the Hockley Hills. Ballot obtained a state legislative appropriation of $412,000 for his village, and planting is now in full swing. "Our goal," says Ballot, "is to become self-reliant in food production. We need an alternative to government dependency and a supplement to subsistence." Rural Venture, Inc., a development corporation centered in Minneapolis, has been contracted to furnish professional planning and development expertise.

The first farming effort, however, is taking place in Ambler, where the project first began. It is being operated as a private enterprise on NANA lands and on the Native allotment of Nelson Griest. Griest, who was raised in the old nomadic Eskimo tradition, never saw a white man before he reached young adulthood.

Since the gardening project began, he has been motivated to farm commercially, but had neither the equipment nor the resources to do so. In the spring 1980 his dream became a reality when Control Data Corporation of Minneapolis donated $90,000 worth of tractor, implements, fuel, and support services to help him get started. Under the example and instruction of Pete Christenson of Fairbanks, Griest became a capable operator and mechanic, and cleared forty acres of land in the spring and summer. Although prudence would dictate that he wait a year for the ground to warm up before planting his first crop, he went on to plant a large test crop of potatoes right away. It was an unusually poor year with the first killing frost on the last day of July. Nevertheless, he managed to harvest 1,100 pounds of potatoes, most of which he sold. As nearly as we know, he is the first Eskimo farmer in Alaska's history. With this taste of success, he is now planning a full-blown effort in potato production for next spring.

In summer 1980, for the first time, carefully monitored test plots of grain were planted in several locations in the Kobuk valley by Dr. Frank Wooding of the University of Alaska. As a result of these tests, Dr. Wooding has confirmed that barley can be ripened in the Kobuk valley, and possibly oats and wheat in a good year. At this time it is impossible to say where these developments will lead, but there is talk of feedlotting reindeer and bringing in sheep and goats.

We Inupiat have always loved the land, and today as yesterday, our survival and security depend on it. But now we are discovering the land is much more valuable than to chase game over, or to camp on, or to dig minerals out of. We are learning that in exchange for an investment of care and labor, the land will produce wonderful foods which were unknown to our people not long ago. By learning to farm, we are insuring that future generations of people here will not only survive, but will prosper.

EXTENSION ACTIVITY 8 2.10

Us! Farming in the 49th

Videotape: "Us! Farming in the 49th"

Read This Before the Program:

"The Last Colony"

"It was 46 years ago today that Elvi first came to the Mat Valley, the first to step off the train. She, her husband and two children arrived with 294 others, and first phase of an experiment to build up the faltering Depression economy and the fledgling territory of Alaska.

They were members of the Matanuska Valley Colonization Project, one of Franklin Roosevelt's first relief programs to provide aid for the thousands of farm families--many on welfare--affected by the Depression. Some federal officials saw the rehabilitation program as the perfect chance to demonstrate Alaska's agricultural potential to the world.

In March of 1935, the State Emergency Relief Administration in Minnesota, Wisconsin, and Michigan sent out social workers to select families who might be suited to a relocation project, and used to farming under cool conditions.

The Federal Emergency Relief Administration had proposed sending 2,000 families to three colonies in the Matanuska Valley, the Homer area, and the Tanana Valley near Fairbanks. But Alaskans, worried that a failure might leave the territory with thousands of unemployed, hungry, homeless settlers, suggested a primary experiment of 200 families, in the Mat Valley, to be run by the Alaska Rural Rehabilitation Corporation. Of the 903 persons chosen, men ranged from 21-46, women from 17-46. Most had no education beyond the 8th grade..."

Carol Murkowski, Anchorage Times, May 10, 1981

After the Program:

Alaska's location makes importing and exporting farm products both difficult and expensive. Choose one of the following then develop solutions to some of Alaska's food production and marketing problems.

1. Develop a transportation system which distributes Alaskan produced fruit, vegetables and dairy products throughout the state. Include rural Alaska in your distribution route.

2. Develop a "public relations" campaign addressed to Alaskans explaining why they should buy Alaska's farm products instead of products brought in from other states, even though prices may be less for out of state products. Include in this marketing plan a slogan, a symbol or identifying logo, and a letter addressed to Alaska's citizens.

3. Make a list of alternative Alaskan food sources. How easy would it be to mass-produce and market these items?

EXTENSION ACTIVITY 9 2.10

Capital Exchange: ANWR

MATERIALS:

VCR and Monitor

*Videotape: "Capital Exchange: The Arctic National Wildlife Refuge" A Discussion with Senator Ted Stevens, May 12, 1987.

On your map of Alaska, outline the ANWR area. (See your Alaska Almanac.)

During the Program:

Make a list of each call-in site.

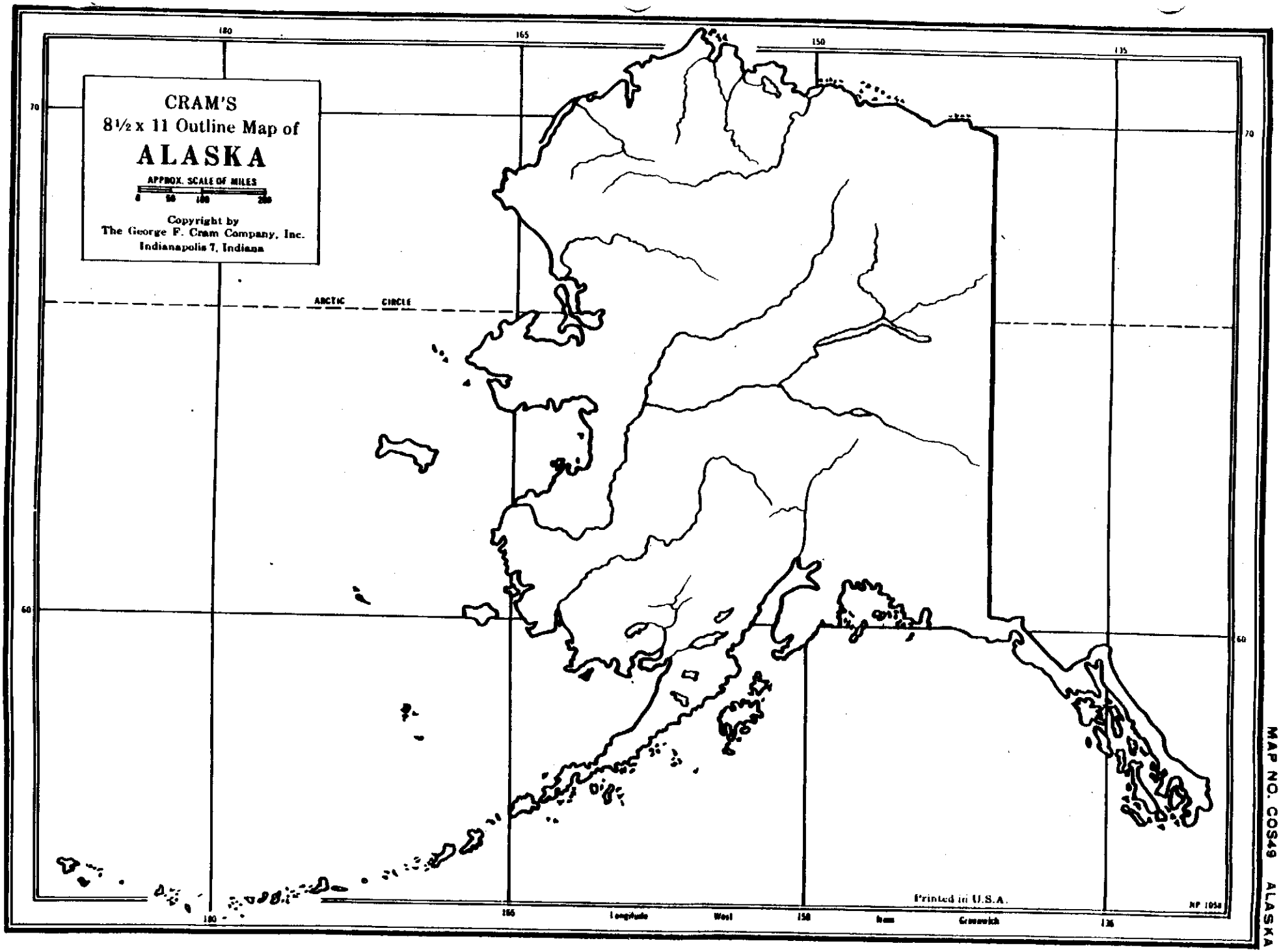
After the Program: Do #1, 2 and 3.

1. Write your own position paper regarding the Arctic National Wildlife Refuge using information gained from the videotape.

2. From news accounts of the ANWR debate, gather information about the Porcupine Caribou herd; why does this group of animals figure prominently in the ANWR issue?

3. Mark on the map which follows, the communities that called in. Is there any correlation between location of the community to the ANWR and the position taken by the caller?

*On March 24, 1989, the oil tanker, Exxon Valdez, spilled close to 11 million gallons of crude oil into Prince William Sound. At this time the ANWR debate in Congress has been put on hold indefinitely.


CRAM'S
8½ x 11 Outline Map of
ALASKA
APPROX. SCALE OF MILES
0 50 100 200
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Indianapolis 7, Indiana
ARCTIC CIRCLE
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Longitude West from Greenwich
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MP 1058

Ted Stevens

United States Senator For Alaska

"CAPITAL EXCHANGE," TUESDAY, MAY 12
TOPIC: OIL EXPLORATION AND DEVELOPMENT IN THE ARCTIC NATIONAL WILDLIFE REFUGE (ANWR)

The United States Congress is debating an issue in Washington, D.C. that could have a major impact on the future of Alaska's economy. The debate centers around the question of when to allow oil and gas exploration and development in the Arctic National Wildlife Refuge (ANWR).

ANWR was created in 1960 when President Eisenhower designated 8.9 million acres in northeastern Alaska as the Arctic National Wildlife Range. In 1980, Congress passed the Alaska National Interest Lands Conservation Act, which included a provision that doubled the size of the range and redesignated it the Arctic National Wildlife Refuge.

During debate of the Alaska National Interest Lands Conservation Act, Congress considered the question of whether to allow oil production in the coastal plain of the refuge. The coastal plain is a 1.5 million acre area located in the northern portion of the 19 million acre refuge which is believed to have significant energy resources. Rather than decide the issue at that time, Congress asked the Department of the Interior to study the coastal plain. The agency was directed to research its oil and gas potential and wildlife resources and recommend to Congress whether it should be made available for oil and gas exploration and development.

On April 20, 1987, Interior Secretary Donald P. Hodel released the results of the five-year study and recommended that oil and gas exploration and development be allowed in the coastal plain of ANWR. Sec. Hodel said he made the recommendation because the study showed the coastal plain to have vast energy resources that can be produced in a manner consistent with wildlife protection.

According to the report, geologists consider the ANWR coastal plain the most outstanding onshore prospect for major oil discoveries in America. There is a 19 percent chance that a major oil field is located beneath the coastal plain. If one does exist, it would contain between 600 million and 9.2 billion barrels of oil. The latter estimate is comparable to the Prudhoe Bay field which currently supplies almost one-fifth of U.S. domestic production.

The average of the estimates of recoverable oil resources in ANWR is 3.2 billion barrels. That amount could provide 4 percent of total U.S. demand and reduce imports by nearly 9 percent. This production could provide net national economic benefits of $79.4 billion, including federal revenues of $38 billion, according to the Interior Department's report.

The Interior Department report also addressed wildlife issues, saying that the effect of production on brown bears, snow geese, wolves and moose would be negligible or minor. It also found that concentrated Porcupine caribou calving areas vary from year to year. According to the report, production may cause some possible displacement of calving areas. However, it is considered unlikely that it would result in any appreciable decline in herd size.

Currently, there is opposing legislation in Congress that defines the ANWR controversy. The U.S. Representative for Alaska, Congressman Don Young, has introduced a bill that would open the coastal plain to oil exploration and development. A U.S. Representative from Arizona, Cong. Morris Udall, has legislation pending that would do just the opposite. His bill would designate the ANWR coastal plain as wilderness, thereby closing it to any oil exploration and development.

Now, Congress must make the final decision on the development of the ANWR coastal plain. The debate is as important for the Nation as it is for Alaska. Domestic oil production is decreasing and the United States is becoming increasingly more reliant upon imported oil. This represents a national security threat that could lead to an oil embargo similar to one that shocked the U.S. in the 1970's.

The issue is just as important for the citizens of Alaska. Prudhoe Bay is now at peak production, but it is predicted that production will diminish by more than half by 1995 and more than three-quarters by the year 2000.

ANWR is a natural replacement for Prudhoe's production decline. The area in question is only 100 miles east of Prudhoe Bay, therefore permitting the use of existing facilities such as the pipeline and the haul road. Timely exploration and development on the coastal plain could lead to production when Prudhoe Bay production begins to decline.

The economic impact of oil production in ANWR would benefit all Alaskans. It would generate revenues from leases and taxes, create jobs and result in general economic growth throughout the state.

The Prudhoe Bay experience proves that major oil and gas fields in the arctic can be developed in an environmentally-sensitive way. We can apply our experience at Prudhoe to ANWR and explore and develop the plain's energy resources without adverse impact on its wildlife.

EXTENSION ACTIVITY 10 2.10

ANCSA: Plain and Simple

MATERIALS:

VCR
Videotape "ANCSA: Plain and Simple"
***You do not need the videotape and VCR to complete pages 261-264.**

TO DO:

Read the following information and fill in the BEFORE column of the true-false quiz at the end. Then, view the videotape if you have a VCR. Fill in the AFTER column and the worksheets that follow. Be prepared to talk or write about the discussion questions.

Background and Additional Information

Aleuts, Tlingits, Haidas, Athabaskans, Yup'iks and Inupiat people lived on the Alaskan land for many thousands of years before white men came. After the U.S. purchased Alaska from the Russians in 1867, it took 100 years, the need for oil from the North Slope, and the pressure from a new state eager to select its land to bring about the passage of the Alaska Native Claims Settlement Act.

Major Provisions of ANCSA

Passed by Congress and signed by President Nixon in 1971, ANCSA did three major things. (1) It provided Native people with written title to nearly 44 million acres of land. (2) It compensated Natives $962,500,000 to extinguish their claim to the rest of Alaska. (3) It established corporations to manage the land and money.

Thirteen regional corporations were established under ANCSA. Twelve are Alaska-based and were able to select land. The thirteenth corporation is for Natives living outside of Alaska. It received money but no land. Two hundred and eleven village corporations were established. Some of them eventually chose to merge with one another because they were too small to function as viable businesses.

Enrollment and Stock

Nearly 80,000 Natives were enrolled in ANCSA corporations. They each received 100 shares of stock in their regional corporation and another 100 shares if they also enrolled in a village corporation. None of the shares could be sold or given away except through inheritance for 20 years, until 1991.

Land Selection

The land was selected because of both traditional use and because of the resources available for development. Since resources are unevenly distributed over the state, Section 7(i) requires that 70% of the profit made by a regional corporation from subsurface resource development be divided among the other eleven corporations.

Approximately, half the land went to regional corporations, the other half was available for village corporation selections. The regions own both surface and subsurface rights over their lands as well as the subsurface rights to all village lands within their boundaries. Individuals do not own ANCSA land unless the village corporation chose to distribute homesites, as he Chickaloon village corporation did with the "shareholder homesite" program, or if the family had established residency in the village as of December 18, 1971. ANCSA lands should not be confused with "Native Allotments," which are 120 acre parcels that were available under the 1887 Allotment Act. This law was repealed when ANCSA was adopted in 1971.

Cash Settlement

The $962,500,000 came from two sources. The U.S. government paid $400,000,000 over an eleven-year period. The remaining $562,000,000 came from the State of Alaska's oil revenues over a six-year period.

EXTENSION ACTIVITY 10 2.10

ANCSA: Plain and Simple

BEFORE YOU VIEW THE VIDEOTAPE: WHAT DO YOU THINK?

This is not a test but an activity to get you thinking. Working independently, write TRUE or FALSE in front of each statement below.

BEFORE		AFTER
____	1. ANCSA established 15 regional corporations	____
____	2. Every Native belongs to both a regional and village corporation.	____
____	3. Each Native ethnic group has its own region	____
____	4. Each Native person born before 1971 received $1,000 in cash from the settlement.	____
____	5. Under ANCSA each Native received 550 acres of land to use as he or she wishes.	____
____	6. Many Natives immediately sold the stock they were awarded.	____
____	7. If oil is developed by one Native regional corporation, the profit from its sale must be shared with all regional corporations.	____
____	8. The corporation system puts the land used for subsistence at risk.	____
____	9. The U.S. Congress returned land to Alaska Natives which totals as much as the whole state of Washington.	____
____	10. Corporations established under ANCSA were to be nonprofit social service agencies.	____

WATCH THE VIDEOTAPE: "ANCSA PLAIN AND SIMPLE."

After you watch the videotape, go back again to the above statements. Once more write TRUE or FALSE, this time after the statement. Then discuss your answers with your classmates. On which statements did viewing the videotape make you change your mind?

Are there any points on which you and your classmates still disagreed after watching the program?

DISCUSSION QUESTIONS

1. What traditional cultural groups inhabited Alaska before the coming of the Europeans and Americans?
2. What are the three major provision of ANCSA?
3. How many Natives were enrolled following the passage of ANCSA?
4. How were Natives who lived outside Alaska notified that they must enroll to a corporation in order to share in the ANCSA benefits?
5. On what criteria were land selections made?
6. What is the purpose of Section 7(i) of ANCSA?
7. Native corporations received $962,500,000 in the ANCSA settlement. From what sources did the money come?
8. Why did some village corporations merge with others?
9. Of lands conveyed to Natives, who owns the subsurface rights?
10. What part of the land do the village corporations own?
11. What is the major asset held by the corporations?

STUDENT WORKSHEET

Name _____ Date _____

VOCABULARY. DO YOU KNOW THESE WORDS?

Match each word in the list with the definition which fits it best.

merge	resource	surface	subsurface
extinguish	village	developer	select
at risk	enroll		

_____ 1. to choose

_____ 2. to combine, to join together

_____ 3. endangered

_____ 4. to sign up or register

_____ 5. a community of people residing in rural Alaska

_____ 6. the outer part of something; the exterior

_____ 7. located below the surface of the land

_____ 8. a person who builds structures or makes other changes on land for purposes of profit

_____ 9. something that a country, state, or group has and can use to its advantage

_____ 10. to put an end to; to make void

STUDENT WORKSHEET

Use the same words in the sentences below. Use each only once.

11. In order to be a shareholder of a Native corporation, individuals had to _____ in 1972.

12. _____(s), some of them Native, are building subdivisions where Native people once hunted and gathered food.

13. Gravel, oil, and fish are some of Alaska's _____(s).

14. Village corporations own the _____ rights to their lands.

15. Regional corporations own the _____ rights and therefore can do mining.

16. Elders of the villages helped _____ the land.

17. When a corporation fails, it may put the land _____ .

18. ANCSA was to _____ Native rights to all but 11% of Alaska's land.

19.20. Some of the _____(s) have _____(d).

EXTENSION ACTIVITY 11 2.10

Using the Land

MATERIALS:

Tape recorder
Paper and pencil
Audiotape; Unit 2, Side A

Before the Program:

Make a list of any places you may have visited, or hope to visit one day, as a "tourist." List how many of these places feature natural landmarks or scenic beauty as the main attraction? In a few brief sentences, explain why you think people are drawn to natural attractions such as the California Redwoods, the Grand Canyon, or Denali National Park?

After the Program:

1. About Alaska: are there advantages to being popular with tourists? List them. Now list an equal number of disadvantages. Why is it significant that the advantages are primarily economical while the disadvantages are environmental? Which, to you, is more important: economics or environment? Which is more important to your town? The state? Please explain your answers.

2. Make a list of any tourism-based businesses in your town. How many of these affect the environment? Is the wildlife affected? If so, propose a solution to this problem without cutting back on the numbers of tourists visiting your community.

3. After listening to the tape, do you feel Denali should be opened up for more tourism? Are buses a solution to the traffic problem? How would you propose to solve Denali's problems?

EXTENSION ACTIVITY 12 2.10

Tourist - Computer Activity

MATERIALS:

Computer
Appleworks
Data Disk #1
Printer (if available)
(If you do not have a printer you will need to send your data disk to your advisory teacher.)

TO DO:

BEFORE:

Load Appleworks and Computer Activity 7 from Data Disk #1 into the computer.

DURING:

1. Read the instructions on the screen. Make a hard copy of the letter from a tourist by pressing OPEN-APPLE P.
2. Load the file, TOURIST, from Data Disk #1.
3. Compose a letter to Mr. Patrick Spens.

AFTER:

1. Save the letter on Data Disk #1. Print out a hard copy of your letter on a printer.

2. Remove the disks.

If you have access to the electronic mail system, you must convert your Appleworks file to an ASCII file. (See Appleworks Reference Manual) Upload your file to the advisory teacher.

ALASKA TRIVIA 2.10

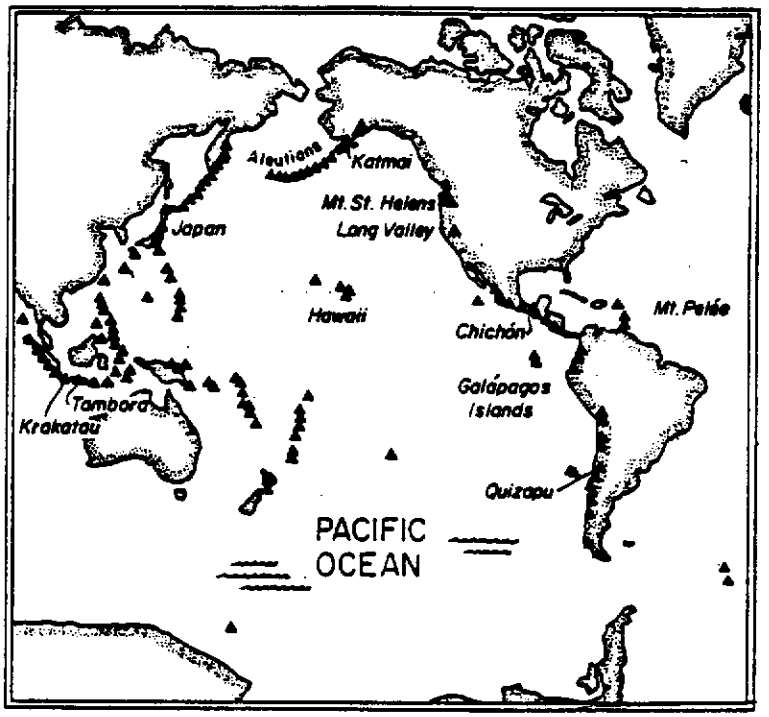
Alaska's Active Land

DID YOU KNOW?

Fossils and magnetic data suggest that Alaska is made up of as many as 50 rock masses ranging from one to several hundred miles square. Part of southern Alaska sailed 9000 km from within 15 degrees of the Equator before docking in its current location. Some pieces, like the Aleutians, are "still arriving."

There are at least 42 active volcanoes in Alaska's Aleutian Volcanic Belt, a part of the Pacific "Ring of Fire."

The most powerful earthquakes in the U.S. have been generated in Alaska. In a given year, Alaska earthquakes produce 20 times the amount of energy generated in the other 49 states. The largest earthquake in North America this century, the Good Friday quake of 1964, opened cracks three feet wide in Anchorage, and the tsunami generated caused death and destruction as far away as California.



Unit 2, Lesson 11 Timber Treasures

Here is Lesson 11, which discusses the timber resources of our state.

It will take you 4-5 class periods to complete the minimum requirements.

Coming up: Look at the activities in Lesson 15 now to see if you need to order any materials.

Warm-up: Complete this first.	☐ Logger's Lingo p. 271
Information: Complete this next.	☐ Timber Treasures, p. 273-280
Extension Activities: Complete at least one.	☐ 1. Clear Cutting vs. Selective Cutting, p. 281* ☐ 2. Area Timber Resources, research, p. 281* ☐ 3. Alaska's Green Resource, poster, p. 282* ☐ 4. Closeup Look at Timber, research, p. 282* ☐ 5. Forest Ranger, writing, p. 283* ☐ 6. Southeast's Totem Poles, research, p. 283* ☐ 7. Timber Treasures, audio, p. 284* ☐ 8. Extended Reading: "Alaska's Forest Resources," Alaska Geographic Society; "Tlingit Woman's Root Basket," L. Shortridge *May be sent via e-mail if student has access.
Sourdough Lingo:* Complete this as you study the lesson.	☐ old growth clear cutting selective cutting buffer strip log boom interior forest subsidy cants coastal forest pulp
Alaska Trivia:* Optional	☐ Tree, Trees, Trees, p. 284
Assessment:	☐ Review your objectives. Assessment 3 follows this lesson. p. 285

WARM UP 2.11

Logger's Lingo

Loggers have a colorful language all their own. For example, take this remark overheard after a hard day's work in the woods.

"It's a good thing that rocking chair was a pecker pole and the donkey puncher had a quick hand on the talkie-tooter or this bucker wouldn't be here."

What in the world did that mean? See if you can figure it out from this loggers' glossary:

- **pecker pole**--small thin tree.
- **school marm**--large tree forked near the top into two separate branches of about equal size.
- **rocking chair**--cut tree that scoots back on stump instead of falling cleanly.
- **widow-maker**--tree with dead limbs that could crash down on logger when tree is cut.
- **faller**--logger who cuts the tree down.
- **bucker**--worker who cuts falled trees into logs.
- **bull buck**--boss of cutting crew--fallers and buckers.
- **yarder**--machine used to haul logs from the woods.
- **choker**--steel cable from yarder that is attached to logs.
- **donkey puncher**--operator of yarder.
- **choker setter**--worker who attaches chokers to logs.
- **chaser**--worker who unhooks chokers.
- **talkie-tooter**--signal whistle on yarder.
- **catskinner**-bulldozer operator.
- **cold deck**--logs piled for storage (usually on land).
- **blow**--log surfacing (like a whale) after it plunges into the water.
- **boom**--raft of logs ready to be towed to the mill.
- **log bronc**--boom boats that can move forward, backward and sideways to herd logs into booms.

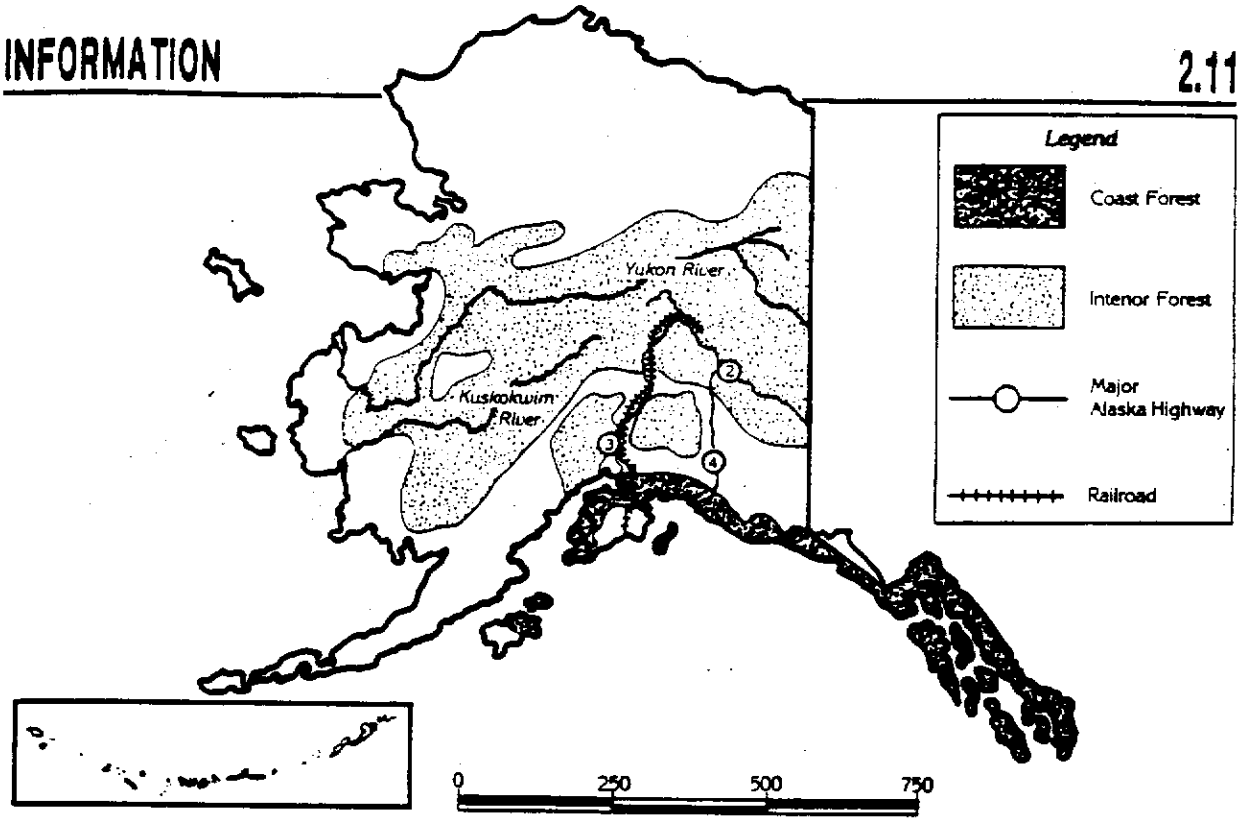
Taken from Alaska Earthlines/Tidelines. November 1983.

Turn this page over to see what we will be learning this lesson.

Timber Treasures

Here's what you will be studying in Lesson 11. Upon completion, you should be able to answer these questions:

- Where are our timber resources?
- Can you name three of our timber resources?
- Can you describe at least one logging method used in Alaska?
- Where are our major timber markets?
- How does our timber resource affect Alaska's people?
- How was wood used in traditional Native culture and arts?



Timber Treasures

WHERE ARE OUR TIMBER RESOURCES?

According to Webster's New World Dictionary, a forest is a "thick growth of trees . . . covering a large tract of land." Growing up, we used to call it "the woods." Do you remember some of the fables you heard when you were a child? There usually was a forest involved, wasn't there?

What comes to your mind when you think of a forest? If you live in Southeast, you may think of Sitka spruce that stand 140 feet high, with a diameter of four feet. If you live on the Aleutian Chain, perhaps your forest is lush grass, low bushes, and bush-like alder and willow trees. Or perhaps you think of graceful paper birch trees surrounding your home in the Interior. People in different parts of Alaska may have vastly different images of a forest.

Our state has two separate forested areas: **coastal** and **interior**. The coastal area includes both the Southeastern Region with the Tongass Forest and the Southcentral Region from Yakutat to Kodiak. The interior area includes the forests of the Arctic, Interior, and Northwest Regions. The Aleutian Chain has very few trees, and those are just bush-sized willows or alders. (See PGA, page 74 for a look at Aleutian Chain "forests" and page 146 has a summary of the timber resources of our state. We will discuss the coastal and interior forests in more detail.

WHAT ARE COASTAL FORESTS LIKE?

The coastal forests are an extension of the rain forests of Washington, Oregon, and British Columbia, Canada. You can see from the map above that most of Alaska's coastal forests are in the Southeast panhandle, an area separated from Canada by the ice-bound Coast Mountains. Most of this forested land is in the Tongass National Forest, owned by the federal government. Some is owned by Native corporations. See PGA, p. 14.

You see on the map above that some areas of this coastal portion have no trees at all. That is because the southeast and southcentral areas of Alaska contain many glaciers and icefields. You also see a narrow band of forest that hugs the coast, bridging Southeast with the southcentral portion of the forest. This is the Cape Yakataga State Forest.

The coastal forest zone continues along the Gulf of Alaska from Cape Yakataga to the Kodiak Islands, where it abruptly ends, halfway through the town of Kodiak. Scientists think that the forest ends here because this is as far as it has been able to reseed itself since Alaska was covered by glaciers. Because of seed dispersal, the forest is moving about a mile to the southwest every 100 years, not only in the Kodiak area, but in other areas of Alaska, like the Seward Peninsula.

WHAT TREES ARE HARVESTED IN THE COASTAL FOREST?

Most of Alaska's timber is **old-growth**, the original forest that hasn't been touched by man. Old-growth forests have trees of all ages, from tiny seedlings to craggy veterans ready to complete their life cycle. Southeast, with about 6.4 million acres of densely forested commercial forest, is the principal location of Alaska's logging industry. Of the annual harvest, 64 percent is hemlock, 28 percent spruce, and the balance is cedar and other species.

Sitka spruce is the largest and most valuable tree in Alaska. It typically reaches a height of 160 feet and a diameter of three to five feet. The wood is moderately light, does not shatter easily, is easy to kiln dry, is straight grained and easy to work. It has a variety of uses: high-grade pulp, airplane parts, boat spars, pianos, and general construction.

Sitka Spruce

Western hemlock ranges from two to four feet in diameter and reaches 150 feet in height. The wood is light and easy to work. Its most important uses include pulpwood, construction lumber, railway ties, and boxes.

Western Hemlock

Western red cedar is found only at the very southern tip of the Southeast panhandle, below Frederick Sound. These trees can attain heights of 70 to 130 feet and diameters of two to four feet. The wood is light, straight-grained, easy to kiln dry, and resistant to rot. These giant trees were fashioned into war canoes by the Haida and Tlingit people. Today cedar is still used for boat hulls, and also for shingles, shakes, poles, and fence posts.

Alaska cedar (or yellow cedar) is a smaller tree, usually ranging in height from 40 to 80 feet and in diameter from one to two feet. You may find it from the southern tip of Southeast northward, until it gradually disappears in the northwestern portions of the area. Its sweet-smelling wood is easily worked and takes a beautiful finish. Window frames, exterior doors, boat planking and cabins, furniture, and cabinets are made from yellow cedar.

Alaska Yellow Cedar

You've learned that southcentral's climate varies from maritime along the Gulf of Alaska to transitional, and finally merges into continental climate. The forests are also transitional, changing from the thick spruce and hemlock forests of Southeast to the sparse birch and cottonwood stands of the Interior.

As you travel through Southeast and Southcentral, it's fun to observe the changes in the trees. Yakataga, bordering on the Southeast region, has valuable stands of Sitka spruce and hemlock. But on Afognak Island, the island directly northeast of Kodiak Island, you'll find Sitka spruce with no hemlock trees at all. In the Susitna Valley, to the north, the most productive timber stands are of white spruce, birch, black cottonwood, or balsam poplar, which typically grow on well drained sites. The Kenai Peninsula has white spruce and mountain hemlock in mixture with aspen and paper birch.

WHO OWNS THE COASTAL FORESTS?

The vast majority of the timber forests in Southeast are part of the Tongass National Forest, which is administered by the United States Forest Service. Look up "National Forests" in A.A. for more information about both the Tongass and Chugach National Forests. There are also state forest lands near Haines and at Yakataga as well as some minor land holdings by various cities and boroughs in this area. Another branch of the federal government, the Bureau of Indian Affairs, oversees timberland on Alaska's only Indian reservation, Annette Island, at the southern end of Southeast. (See PGA, page 18). As a result of the Alaska Native Claims Settlement Act passed in 1971, Native corporations have become owners of approximately 464,000 acres of forest land in Southeast.

Southcentral forests are not controlled as much by the U.S. Forest Service, and only a small amount of the Chugach National Forest is commercial forest land. Three Chugach Native corporations own forest land in this region as well.

The forests of Kodiak and Afognak Island are owned primarily by Native corporations.

Commercial timberlands on the Kenai Peninsula are owned by the state (20%), private Native corporations (20%), the U.S. Forest Service (12%), and the Kenai National Moose Range (39%). (Let's hear it for the moose!)

WHAT ARE THE INTERIOR FORESTS LIKE?

The climate of the Interior is much different from that of the coastal area, and so are its forests. The Interior is warmer in summer, colder in winter, and much dryer year round.

Growing conditions are also different. Daylight is almost continuous in the summer months and almost nonexistent in the winter months. Much of the area has permafrost below the top layer of soil, especially on north-facing slopes. Even though precipitation is very low, most Interior forests have layers of moss and lichens covering the soil. This layer catches fire very easily during the hot, dry summer, and forest fires have been a dominant force in shaping the structure of the forests, allowing for the growth of birch and aspen.

Because of these differences, you won't find giant trees in the Interior. In fact, many areas have no trees at all.

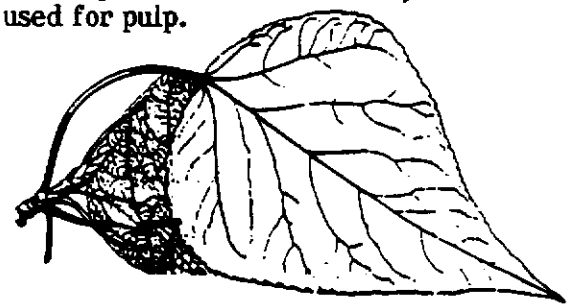
WHAT TREES ARE HARVESTED IN THE INTERIOR FORESTS?

Commercial forests in the Interior are dominated by white spruce (64%), birch (21%), and poplars (15%). (See PGA, pp. 62 and 71 for a glimpse of what this forest looks like.) Most of the commercial forests are located on lowlands along the flood plains and low river terraces of the Kuskokwim, Yukon, and Tanana Rivers. These rivers provide access to the forests. Upland forests, being farther from a market, have more limited potential for commercial use.

White spruce extends over a vast acreage in the Interior. On good sites, it can be 6 to 18 inches in diameter and 40 to 70 feet tall. Spruce as tall as 80 to 115 feet and with a diameter of 30 inches can be found on the best sites. This spruce is very strong for its weight, glues easily, paints well, and is good for high quality pulp.

Paper birch is small to medium sized, usually ranging from 4 to 12 inches in diameter and 20 to 60 feet in height. On good sites, birch can attain 24 inches in diameter and 80 feet in height. It is used for furniture, cabinets, veneer, boxes, and pulp.

Balsam poplar can grow to heights of 100 feet, with diameters greater than 24 inches. Its primary uses are for boxes, crates, and sometimes for house logs. Although the fibers are short, it can be used for pulp.



Look-Alikes
(Balsam Poplar/Black Cottonwood/ Quaking Aspen)

Black cottonwood is a large tree, growing 80 to 100 feet tall and three feet in diameter. It is very similar to balsam poplar, except that it is bigger. The wood is used for boxes and crates, pulp, veneer, and lumber.

Quaking aspen is a small tree, typically growing 20 to 40 feet high and 3 to 12 inches in diameter. It will often occur in thick groves, with no other kinds of trees present. The wood is light, weak, soft, and has high shrinkage. Aspen is suitable for pulp, boxes, and waferboard.

Sometimes black spruce and tamarack are also found on commercial forest land, but they are usually not harvested.

WHO OWNS THE INTERIOR FORESTS?

The Interior has no national forests, although much forested land is federally owned and held as National Parks, Wildlife Refuges, part of the Wild and Scenic Rivers system, or by the Bureau of Land Management under their Conservation and Recreation Areas. A state forest of 1.8 million acres was established in the Tanana River Valley in 1983.

Native corporations are becoming major timber land holders in this region. It is estimated that they will control about 16 million acres of Interior land containing more than 6 million acres of commercial forest.

WHAT LOGGING METHODS ARE USED IN ALASKA?

Trees are usually harvested in Alaska by **clearcutting,** a method by which all trees in an area are logged at once. The amount of forest in the area that is clearcut ranges from 20 to 160 acres, depending on factors such as the condition of the stand, potential for blowdown (toppling of unprotected trees by wind), aesthetics (how it looks), stream protection, accessibility, and economics.

The other major logging method used in the United States is **selective cutting,** where only selected mature trees are cut, leaving the rest of the trees to grow to maturity. The problem with this method is that it is expensive and it damages the trees left standing. This is a special problem with hemlock, which rots very easily when wounded.

Loggers prefer clearcutting over selective cutting for several reasons. Clearcutting allows full sunlight to hit the forest floor, providing the best conditions for new seedlings to grow and mature in about 100 years. Also, in Southeast, the forests contain a tree parasite, mistletoe, that deforms and stunts the trees. Clearcutting helps to eradicate this pest.

In coastal forests, the root systems of trees are shallow because the soil layer is very thin. Trees in interior forests must grow in a thin layer of soil also, since permafrost underlays much of the area. Consequently, forests in both areas are susceptible to blowdown. This happens when some trees are removed and others are left behind. In clearcutting, this problem occurs occasionally at the edge of a clearcut area.

While clearcutting may have advantages, there are also problems with this logging method. Imagine that you are a tourist taking the cruise of a lifetime up the Inside Passage and throughout Southeast Alaska. The last thing you would expect or wish to see is a huge scar on the mountains caused by clearcut logging. Clearcutting is ugly.

There have been continuing studies on the effect of clearcutting on our wildlife resources. Scientists found that clearcutting entire areas is harmful to salmon spawning streams, so most clearcuts now leave "buffer strips," uncut areas, along streams. This protects salmon habitat from the effects of erosion. Studies also show that the Sitka blacktail deer population needs old-growth, mixed forest areas to survive. Deer use the tiny forest meadows between the old-growth trees for food and shelter during the winters. They cannot use the new forests that spring up after clearcutting, because they are so thick that no sunlight reaches the forest floor, and the plants on which deer browse cannot grow.

HOW DO STATE AND FEDERAL REGULATIONS AFFECT THE TIMBER INDUSTRY?

Logging affects all the animals and plants of the forest. Regulations have been adopted that protect fish and animal habitat. One we have mentioned is the requirement that **buffer strips** be left beside salmon spawning streams. When logging roads are built, regulations govern where and how they are built. In Southeast Alaska, logs are gathered to a central area on the water to be formed into **log booms** or to be loaded onto ships for transportation. The location of these "**log dumps**" is chosen and supervised by Forest Service personnel.

Other regulations spell out what kinds of products can be exported from national forests. In order to encourage the growth of pulp and timber mills and provide year-round jobs for Alaskans, the U.S. Forest Service requires that raw logs cut from U.S. forests be processed by a local mill before they leave the state. Usually the mills saw the logs into **cants**, eight-and-one-half inch slabs cut on two sides. Logs that cannot be made into cants or lumber are used for **pulp** or exported as **chips**. Both pulp and chips are ground up logs used as the raw material for making wood products.

Since Native lands are private lands, the U.S. Forest Service regulations don't apply to them. Their timber can be shipped as logs, or "in the round," which is the way big overseas customers like Japan prefer. Then their own people can have the milling jobs. Timber companies who cut timber from federal lands and must process their logs don't feel this is fair. They feel that the processing law should apply to everybody, whether they cut their logs on federal land or in their own backyards. If you were head of a timber company, whose timber would you cut?

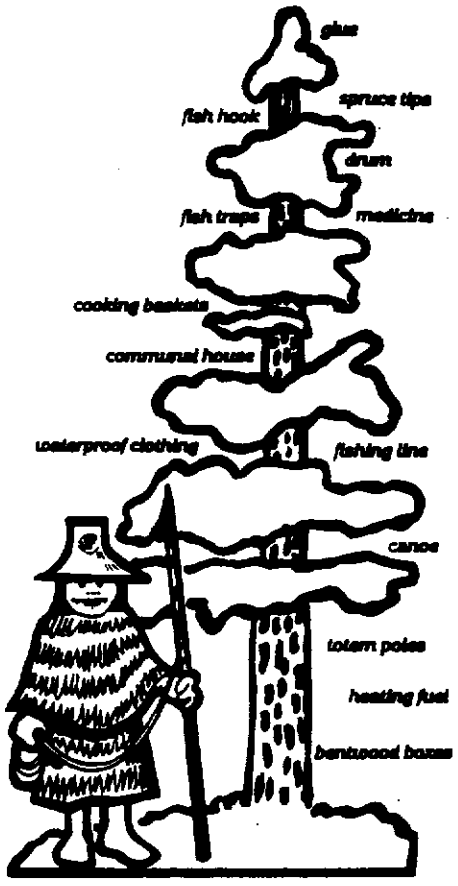
Long-term sale contracts specify the amount of timber that can be harvested each year from federal forest lands, and make it possible for Southeast pulp mills to operate. At the time these contracts were signed, all land within the national forest was available from which to cut timber. However, the statehood act, the Alaska Native Claims Settlement Act, and the Alaska National Interest Land Conservation Act removed much of the federal forest lands that had been promised to timber companies for cutting. Now forest land in much more inaccessible areas had to be selected for timber lands. To offset increased costs to timber companies, the federal

government promised $40 million per year to the U.S. Forest Service for the purpose of building roads to less accessible forest areas. Some people call this a **subsidy** (a grant of money) of the timber industry, while others argue it is a subsidy for national interest lands that citizens want to protect from logging. Which do you think it is?

WHAT ARE SOME PRODUCTS WE GET FROM OUR TIMBER?

Alaska's forests are big business. The heart of the timber industry is in Southeast Alaska where old growth stands of hemlock and Sitka spruce yield around 95 percent of the state's timber harvest or about a half-billion board feet per year. (A **board foot** is the amount of wood in a piece of lumber one foot long, one foot wide, and one inch thick.)

These dense coastal forests have always been important to the people who lived there. Long before the white man came with axes of iron and steel, the coastal Indians had figured out how to fell the giant trees using just fire and tools of jade, bone, and wood. They used every part of the tree, and made many useful things which supported their lives.



While the Russians were settling in Alaska about 200 years ago, they cut trees to build fur-trading posts and began the first shipyard near Sitka. They soon had steam-powered mills that produced about 3,000 board feet a day. That was the beginning of Alaska's timber industry.

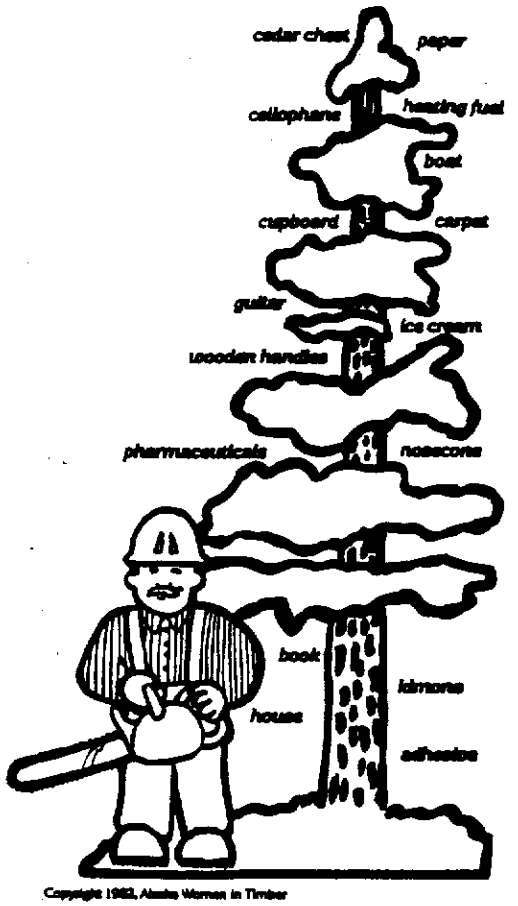
After the purchase of Alaska by the United States, the timber industry continued to grow slowly, and has been an important component of Alaska's economy for over a century.

The amount and type of timber products have been influenced by the U.S. Forest Service, which controls most of the land that is logged.

The primary products from Southeast forests are cants and pulp. There are two pulp mills in Southeast, one in Ketchikan and one in Sitka. Both produce a kind of pulp used in the manufacture of rayon.

Southcentral, with a more varied timber stock, has a greater number of products. With a more developed system of roads, railroads, and waterways, plus more than 60 percent of the state's population, the local market for timber products is greater there. Besides the production of cants for export, numerous small sawmills produce timbers, green lumber, and house logs.

In the Interior, local markets for building materials and firewood are the mainstay of the timber industry. House logs are an important product. Research is being done on a number of other uses for Interior wood products such as charcoal, fuel logs, and wood chips or compressed wood pellets that can be used as fuel for electrical power generators.



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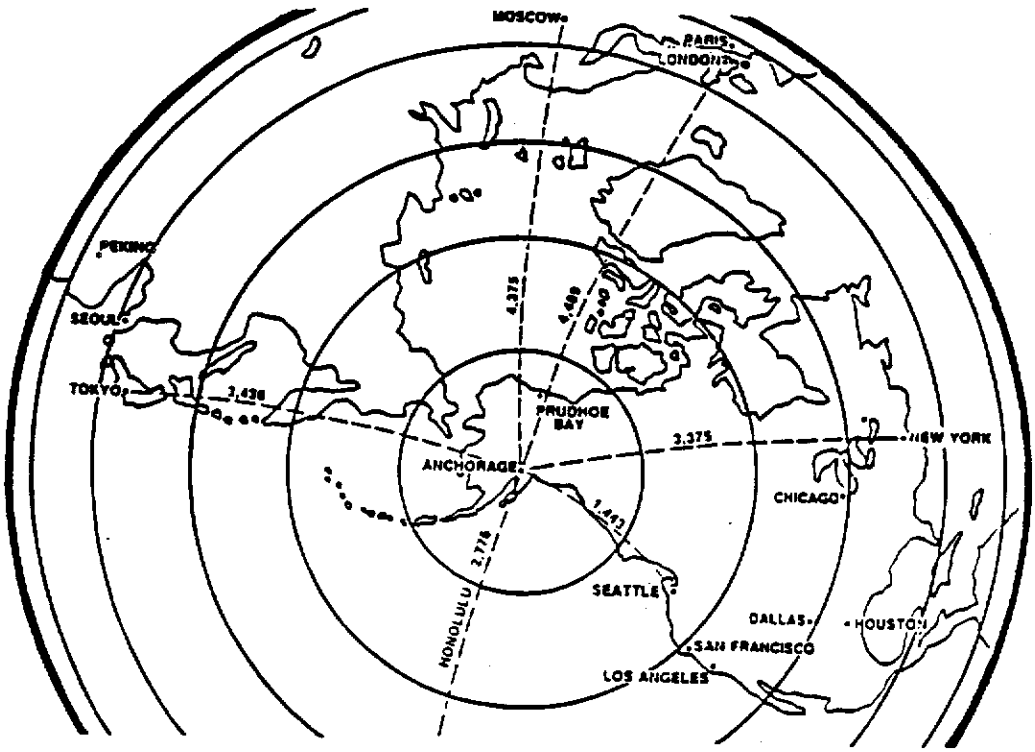
WHERE ARE OUR MAJOR TIMBER MARKETS?

We discussed local timber markets in the previous section, and talked about cants. Where do these cants go? Almost all of the cants are shipped to Japan and other Pacific Rim countries. Japan and Korea also buy natural logs from the Native corporations. They prefer natural logs to cants because they want more jobs and industry at home, too, and unprocessed logs are cheaper.

Smaller markets are becoming more important. Taiwan imports hemlock and spruce cants. The People's Republic of China is becoming an important trade partner as it opens its markets to foreign products and it has an increasing demand for housing.

The European market holds some possibilities for the future. Look at a map of Alaska from the perspective of air travel from Anchorage. The distance to Tokyo and New York are almost identical, while the distance to London is only slightly more.



GLOBAL PROJECTION CENTERED ON ANCHORAGE

There is also potential for increased local markets within Alaska. New uses for pulp, new forest products, and improved logging techniques are being researched. Converting harvest wastes to fuel, using compressed wood products for fuel, and using chips to generate electricity are a few of the ways the industry is hoping to expand its markets.

HOW DOES OUR TIMBER RESOURCE AFFECT ALASKA'S PEOPLE?

We have already mentioned how Alaska's forests provide jobs and building materials for the state. The forest industry has always been a primary user of local labor and resources. One of the reasons for establishing pulp mills in Southeast was to provide industry for the area. If the timber industry grows, it continues to provide a source of employment in many of the smaller, isolated communities of the state. Small local mills can be set up in any area where timber is available for harvest.

It is good for Alaska's economy that the timber be processed as much as possible in state because more local jobs are created. For instance, lumber products require more labor than do cants, and round logs provide no processing jobs at all.

TO DO: LEARNING LOG

Answer the following questions with as much detail as possible:

1. Here are some things I know now that I did not know before.

2. Here are some things I would still like to know:

EXTENSION ACTIVITY 1 2.11

Clear Cutting vs. Selective Cutting

TO DO:

1. Conduct research into the benefits and drawbacks of clear-cutting and selective cutting of forests in Alaska. The U.S. Forest Service would be a good place to start for resources. Form an opinion about which harvest method you prefer.

2. Illustrate your findings on a poster or chart. Use magazine pictures or your own photos to illustrate this poster or chart.

3. Then prepare a speech of at least two minutes explaining the advantages your harvest choice. Give your speech to friends, family, or your class. Record it on audiotape or videotape for your teacher.

EXTENSION ACTIVITY 2 2.11

Area Timber Resources

TO DO:

Here's a project for your community and nearby area. Find out what your area timber resources are. (If you live in an area where there is virtually no timber, please choose another activity.) Here are some possible questions you may want to answer:

Do any commercial timber trees grow here?

Is any commercial logging done in this area?

What subsistence uses of the forests are there?

How does your family use the area timber resources?

What is the relationship of your timber resources to the animal population of the area?

Who owns and controls the timber in your area?

How does timber affect your local economy?

To report: Choose any way you want of reporting: interviews, audiotape, photo report, videotape, written report, pamphlet, etc.

EXTENSION ACTIVITY 3 — 2.11

Alaska's Green Resource

MATERIALS:

Various leaves from trees in your area
Posterboard
Glue or paste
Markers
A tree identification book

TO DO:

1. Collect and press leaves from at least three different kinds of trees. (Yes, needles are a kind of leaf!) Try to find trees that might have some commercial value. Use your identification book to name the species and to find out information about the tree type.

2. MAKING YOUR POSTER:

   Your poster title is "Alaska's Green Resource." Your poster will have your pressed leaves on it. Describe your species in some way on the poster. Make it interesting and colorful. Tell how trees can be used as a natural resource.

EXTENSION ACTIVITY 4 — 2.11

A Closeup Look at Timber

TO DO:

You may live near an operation that logs, mills, or uses our timber resources in some way, like for firewood or building materials. If so, try to set up a visit to that business or person. Make a photo essay or use audio or videotape to describe the use of timber. Find out the economic and social impact of that timber resource in your community. How do state and federal regulations affect this business or individual. What is the market for the timber products?

Be sure to set up your questions or outline of your report before you go. It will make your trip more worthwhile.

EXTENSION ACTIVITY 5 2.11

Forest Ranger

Comments: Part of your job as a forest ranger is to provide instruction to hikers and campers. Your presentation is to persuade visitors to Alaska's forests to behave with respect and care for the natural setting. Write your presentation. (At least 4 paragraphs.)

EXTENSION ACTIVITY 6 2.11

Southeast's Totem Poles

Comments: Southeast Alaska is an area rich in natural resources. It is a densely forested area. Wood was used for houses, canoes, totem poles, and ceremonial objects. Research the history of the totem poles of Southeast or in your area. Select a totem pole and describe what crests are represented, who it was made for, who made it, and what stories are associated with it.

EXTENSION ACTIVITY 7 — 2.11

Timber Treasures

MATERIALS:

Tape Recorder
Paper and Pencil
Audiotape; Unit 2, Side A

TO DO:

After listening to the tape about the timber industry in Alaska, answer the following questions.

1. The logging method in which all the trees in an area are removed.

   A. tunnel cutting
   B. strip cutting
   C. rotation cutting
   D. clear cutting

2. You selected D, good job - now explain in a well written paragraph the two different views about clear cutting expressed in the interview. You might have to listen to the tape again to pull out important information.

3. What consideration must be taken when logging on Federal land?

4. The process of cutting, shaping and fininshing a product such as wood.

   A. milling
   B. reclaiming
   C. rotating
   D. tailing

5. You selected the letter A - super - now name some products that come from logs that are milled in Alaska.

6. Write at least four sentences giving your opinion as to whether logging should be expanded and developed or whether that logging should not be expanded and developed. Convince me.

ALASKA TRIVIA — 2.11

Trees, Trees, Trees

The U.S. Department of Agriculture says Alaska has fewer species of native trees than any other state, yet Alaska contains 16% of all forested lands in the United States.

The Sitka spruce is Alaska's official state tree.

Can you think of a little-known fact about our trees? Write it here?

ASSESSMENT 3 (Lessons 9-11) 2.11

You have completed Lessons 9-11. Now it is time to find out how much you have learned. Go back and review the objectives for each lesson. Your home teacher has Assessment 3 in his or her test packet. Your home teacher must monitor you while you are completing Assessment 3.