CHECKLIST 2.12

Assessment 4 (Lesson 12-13)

Name _____

Date _____

You will need to send the following to your advisory teacher after completing Lessons 12-13 and Assessment 4.

___ **Assessment 4**

Lesson 12

___ Learning Log

___ 1 Extension Activity (list)

___ _____

___ Sourdough Lingo

Lesson 13

___ Learning Log

___ 1 Extension Activity (list)

___ _____

___ Sourdough Lingo

Unit 2, Lesson 12 — Mineral Wealth

Here is Lesson 12, which studies the mineral resources of our state.

It will take you 10 class periods to complete the minimum requirements.

Coming up: Look through the extension activities in Lesson 16 now to see if you need to order an materials, e.g. "How to Make a Uluaq," "How to Build a Dog Sled," Tlingit Mask and Yup'ik Mask Kits, Button Blanket and Bentwood Box Kits, etc.

Warm-up: Complete this first.	☐ Gold Panning, Alaska Style, p. 291
Information: Complete this next.	☐ Mineral Wealth, pp. 293-302 ☐ Hard Rock and Placer Mining in Alaska: The Searchers, optional video
Extension Activities: Complete at least one.	☐ 1. Mineral Research, p. 303* ☐ 2. Alaska Coal, video, p. 305* ☐ 3. Mining Field Trip, p. 305 ☐ 4. Mining Legends, creative writing, p. 306* ☐ 5. Extended Reading: "A History of Mining on the Kenai Peninsula," M.J. Barry; "Hard Rock Gold," B. and D. Stone ☐ 6. Prospecting Alaska, interview, p. 307 ☐ 7. US! Oil Spill: Alaska's Big Spill, video, p. 308* *May be sent via e-mail if student has access.
Sourdough Lingo:* Complete this as you study the lesson.	☐ boom bust ore lode placer deposits drift mining sluice box tailings hard rock mining
Alaska Trivia:* Optional	☐ Minerals and You, p. 310
Assessment:	Have you achieved all of our objectives? Assessment 4 appears after the next lesson.

Gold Panning - Alaska Style

Your gold pan works in the same way as a stream of flowing water. You swish the water around in the pan to wash the gold off the rocks and gravel. Then you slowly wash the remaining sands and lighter materials off the rim of your pan, leaving the heavy gold at the bottom.

Easier said than done, of course. But practice makes perfect--and you can practice in your own backyard. Just get some #6 or #4 lead birdshot--which is heavy and will act as gold--and mix it up well with dirt, gravel and sand. You could also use fishing split shot, sinkers, or nuts and bolts for your "practice gold." Then fill a washtub with water and let a gentle stream trickle out from your garden hose. Your gold pan can be an ordinary pie pan. Follow these steps to see if you can wind up with the gold (lead) in the bottom of your pan.

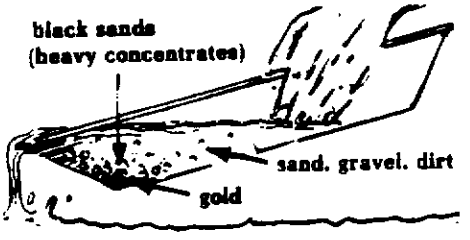
1. Fill your pan almost to the brim. Then look around for a good panning place. Ideally, the water should be about six inches deep and flowing fast enough to keep the muddy water from your pan out of the way. (You'll be using your garden hose stream.)

2. Put your pan down into the water and shake it back and forth to settle the rocks and dirt. Try not to let anything escape. Wash off the larger pieces and throw them away.

3. Now the real panning begins. Hold the pan by the opposite rims and tip it slightly away so that the outer edge is about two inches lower than the side towards you. Swirl the water in the pan by moving your arms around and around in a circle or oval, with a slight forward-tossing motion. The idea is to make the water climb and spill over the outer wall of the pan, carrying the lighter soil and gravel with it. Level the pan a bit from time to time and shake it back and forth to keep the gold safely at the bottom.

4. When you're down to a cupful or so of material, slow up and be careful. Keep dipping in fresh water and continue the same panning process until there are only a few tablespoons of heavy particles on the bottom. Then stop and take a look.

5. Dip up about a cupful of water and back away from the stream. Hold your pan level and slowly swirl the water around to spread out the heavy materials that are left. Any small nuggets or gold particles will show up right away. Pick them out and put them in your gold bottle. To check for finer grains, gently swirl the water up the sides. The lighter material will move along first with the water, and the heavier gold will string out in a fine line behind. With practice, you can stop the motion of the pan and catch these "fines" with your thumb.



OBJECTIVES 2.12

Mineral Wealth

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

- How are boom and bust cycles in Alaska related to minerals?
- What are three important mineral resources?
- What are some of the major markets for our minerals?
- How do mineral exploration and development affect Alaska's people?
- Where are commercially valuable minerals found in Alaska?
- What two kinds of mining occur in Alaska?
- How do state and federal regulations affect Alaska's mineral resources?
- How does the Alaska petroleum industry affect Alaska's wealth, development, and lifestyle?
- What were some geographic considerations involved in determining the route of the Alaska pipeline?
- How is Prudhoe Bay oil extracted and marketed?
- What environmental safeguards protect against oil and mineral hazards?

HOW ARE BOOM AND BUST CYCLES IN ALASKA RELATED TO MINERALS?

Pause for a moment. Send yourself back in time, to the spring of 1900. You live in New York, and you have just learned that the beaches of Nome, in far away Alaska, are covered with gold. People are saying that the entire ocean floor is covered with gold, which washes up on the beach. You make immediate plans to head for Seattle, where steamers are leaving daily for Nome, loaded with eager gold-seekers, their "grubstakes," and their gold extracting contraptions. Your time machine has taken you back to a gold rush--a boom time for Alaska. See pp. 124-133 in The Alaskans for an eyewitness account.

Alaska's economy has been characterized by periods of "boom and bust." An **economic boom** is a period of rapid growth, prosperity, and wealth. Lots of people move to an area where there are many jobs and much money to be made. It is often characterized with a period of inflation too. Towns grow overnight, springing up in the middle of the wilderness. During the **bust** the sources of jobs and money disappear, along with most of the people who came looking for them. See p. 138 of The Alaskans for an account of the Klondike bust.

Alaska has had several booms that were directly related to development of mineral resources. Gold was first discovered in 1870 near the area that has become the present-day Juneau. After much prospecting, the gold-bearing area stretched for over a hundred miles along the coastline. The area was called the Gold Belt. By 1880, the tide of prospectors had turned into a gold rush. About 10 years later, after gold was discovered in the Yukon, a second rush of people traveled through southeastern Alaska to Skagway, where they made the torturous trip along the famous Chilkoot Trail to Lake Bennett. After making their own boats and rafts, the prospectors floated the Yukon to the gold fields.

The Nome rush followed, bringing thousands to the beaches of Nome. Shortly after, much prospecting was done in interior Alaska, and Fairbanks became the supply depot for the entire area. See "Gold Strikes and Rushes" in your Alaska Almanac for a list of all the booms that have occurred because of gold. Were any strikes near where you live?

A rush of another kind occurred near present-day Cordova at the same time sourdoughs were scratching the beaches of Nome. This was an oil strike near Katalla. During the time oil was produced commercially, in 1907, estimates placed the population of Katalla as high as 10,000. This "boom" year was followed immediately by a "bust," since there was no market for the oil. The population declined rapidly and all that remains of Katalla are a few buildings.

Another oil boom that had a larger effect on Alaska was the discovery of a giant oilfield beneath the chilly waters of Prudhoe Bay in 1968. This modern-day boom attracted thousands of outsiders to Alaska for the many jobs available in building the Trans-Alaska pipeline from Prudhoe Bay to the ice-free port of Valdez. The oil boom has affected the entire state of Alaska because of the revenues oil brings to our state.

These are a few examples of the booms in Alaska caused by mineral exploration. Some of the effects of the booms were long lasting. For example, while many Alaska gold rush towns were abandoned after the gold was gone, others, like Nome, Fairbanks, and Juneau, remain. And the roads that connect the mining towns remain. The Elliott, Richardson, and Steese highways that we use today were built to connect mining towns.

WHAT ARE THREE OF OUR IMPORTANT MINERAL RESOURCES?

The minerals that produced these boom and bust cycles in Alaska exist because of Alaska's dramatic geologic past. The

same forces that produced our beautiful landscape formed valuable minerals within the earth's crust. Hundreds of sites throughout the state contain potentially commercial deposits of 27 valuable minerals.

A mineral called molybdenum is essential for making high-strength steels. The largest reserve of molybdenum in the United States has been discovered on an island near Ketchikan. This mine, called Quartz Hill, may soon be producing this metal. The Greens Creek mine on Admiralty Island in Southeast is another discovery that is rich in many minerals, especially silver. The Ambler district has the largest known copper reserve. The ore here is 4 percent copper, as compared to copper ore containing only 0.5 percent in the Lower 48.

Gold occurs in many places throughout Alaska and is still being mined. Find out more about production and location of gold from AA pp. 70-71. The maps on page 146 of PGA show major mining areas for gold.

The largest silver, lead, and zinc ore deposit in the western world that is scheduled for production is found at Red Dog, a mine north of Kotzebue. The NANA Regional Native Corporation owns the mine and is in partnership with a Canadian mining company called Cominco to develop and manage the mine. The Red Dog will provide jobs for the nearby NANA Corporation members as well as money for the entire state, since 70 percent of the profits will be shared with the other 11 regional Native corporations as part of the Alaska Native Claims Settlement Act.

With the Prudhoe Bay oilfield, Cook Inlet wells, and the possibility of the Arctic National Wildlife Refuge opening up for oil exploration, oil remains the most important mineral in Alaska. Natural gas is also found with oil deposits, and there may soon be outside markets for Alaska's natural gas. Read about our oil and gas resources on pp. 144-145 of PGA or "Oil and Gas" in AA.

Coal has been important in Alaska for many years. In the mid-19th century, Russian ships, yankee whalers, and revenue cutters all used Alaska coal. Coal from several small mines was used to power some Yukon riverboats during the gold rush of the 1890's. Other mines have been in production at various times, and one of the most productive mines is still in operation near Healy, Alaska. The coal resources for Alaska are comparable to the entire oil reserves for the world. Read "Coal" in AA to learn more about our coal resources.

The selection called "Minerals and Mining" in AA will give a summary of some of the greatest mineral resources of our state. You will be surprised to learn that some of our most valuable minerals are sand, gravel, and stone.

WHAT ARE SOME OF THE MAJOR MARKETS FOR OUR MINERALS?

Alaska is in a good position for marketing its minerals, because of the proximity of developing Pacific Rim nations. Countries like Japan, Korea, and Taiwan are becoming our best customers.

Besides the Pacific Rim markets, many of our minerals find markets in the Lower 48. Prudhoe Bay oil is shipped to refineries in California, and supplies approximately 20 percent of the oil needs of the United States. Other markets are local, within Alaska. The coal mined near Healy is sold mostly within Alaska, although a Korean market has recently been developed. Much of the natural gas from oilfields in southcentral Alaska fuels homes and businesses in Alaska.

HOW DO MINERAL EXPLORATION AND DEVELOPMENT AFFECT ALASKA'S PEOPLE?

A Kotzebue bush pilot of the 60's wonders about the red and orange rocks in a creek over which he regularly flies. Further investigation reveals the lead-zinc deposits of the famous Red Dog mine,

named after the red dog owned by the bush pilot. A pilot flying over Admiralty Island views a reddish-stained scar on the hillside where little vegetation grows. Named "Big Sore," this is one of the clues that leads to the discovery of the Greens Creek project, which contains silver, zinc, lead, copper, and gold ore. In the 19th century, Eskimo travelers first find the oil seeps that blacken the tundra at Cape Simpson, 150 miles northwest of Prudhoe Bay. Years later, the knowledge leads to one of the greatest oil discoveries of the century.

These are a few examples of Alaskans who are involved in exploration of mineral deposits. Others, mostly prospectors or geologists, come to live in Alaska because of the chance of making a valuable discovery. Their finds have many effects on the people who live in Alaska. The mines built to extract these resources are often the source of jobs. People work in the mines or provide support services for the mines. Whole cities are sometimes built because of the mineral resources of an area.

When mineral resources are gone, this often causes the opposite effect. The Treadwell mine on Douglas Island, across from Juneau, was the largest producer of gold from low-grade ore. This mine, and three others next to it supported the thriving city of Treadwell. Over 2,000 men worked the mines 363 days a year in round-the-clock shifts. Then, on April 21, 1917, tidewater flooding from Gastineau Channel filled the mine in a mere three-and-one-half hours, and Treadwell became a ghost town within a few years. Today, all that visibly remains of the four great Treadwell mines are a few foundations, rusted machinery, and a flooded hole. Because the ore was low grade, no thought was given to resurrecting the mine. It is hard to imagine that these mines produced $67 million in gold.

Mineral development brings money to our state. Since the advent of the trans-Alaska pipeline, the oil from Prudhoe Bay has brought the state billions of dollars in royalties and taxes. Oil supports a majority of state government services. The state has established a Permanent Fund, where 25 percent of the income from oil is deposited. The fund is invested, and the proceeds from the investments are shared with all Alaskan residents in the form of yearly Permanent Fund dividends.

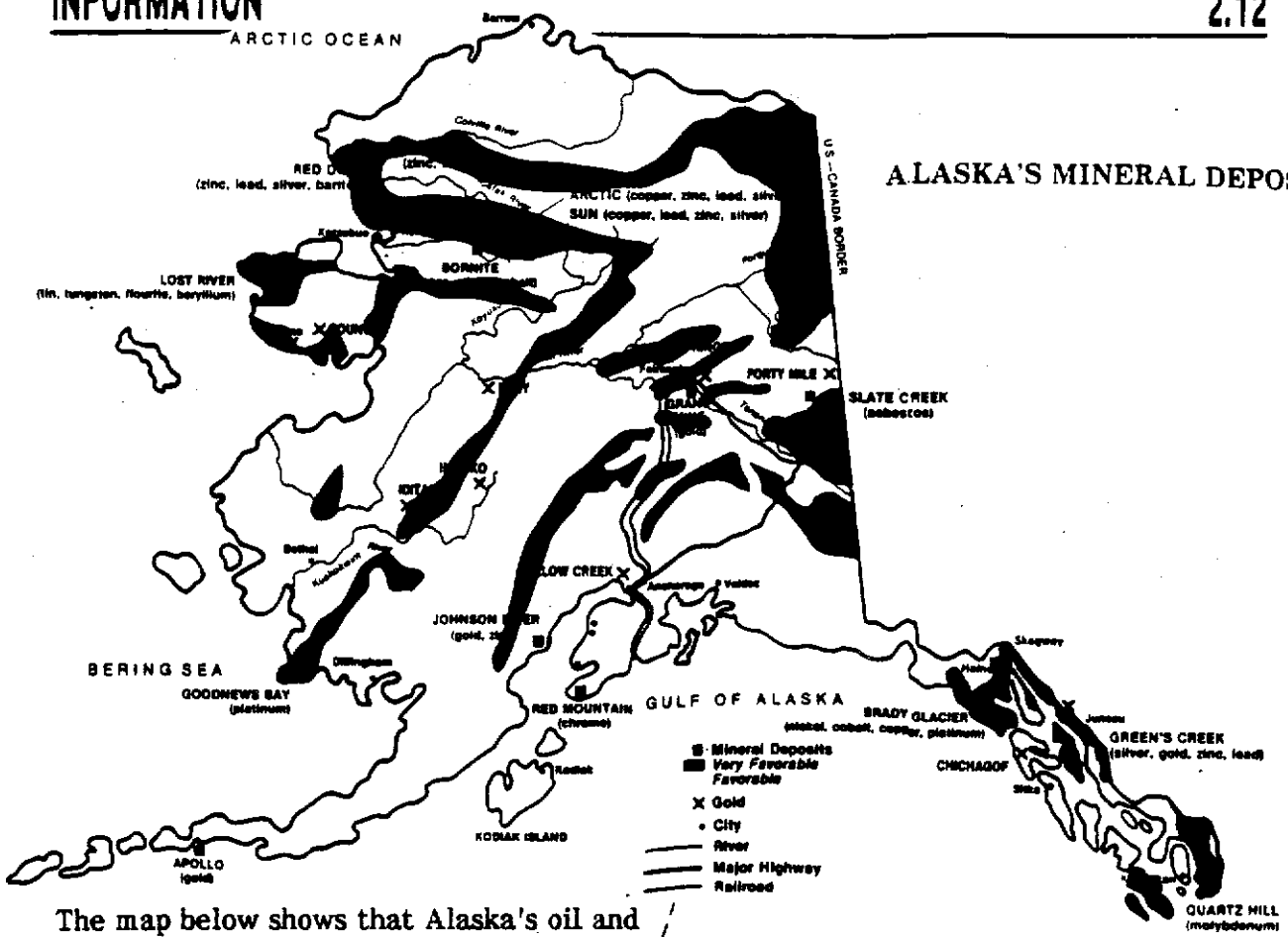
One of the most valuable resources of all is the land itself, and Alaska has taken steps to guard against destruction of the land for a short-lived mineral boom. The Trans-Alaska pipeline was built to minimize its effect on the environment, as we will learn later in this information section. **Placer** miners working the creeks in the Interior are subject to water quality standards that can limit the amount of gold they are able to mine. Another effect mines have on the land is the transportation corridors to the mine itself. This causes roads to be built, opening up land that previously was inaccessible to people.

Alaska is a resource-rich state with a small population. With most minerals, the raw materials from the mine are shipped out of the state for refining. To reap more benefit from our minerals, refining and product development could occur within our state, bringing jobs and less expensive products to our people. If products are manufactured within Alaska, it may offset in part the high transportation costs paid to import products from other states, although more damage may be done to the environment.

WHERE ARE SOME COMMERCIALLY VALUABLE MINERALS?

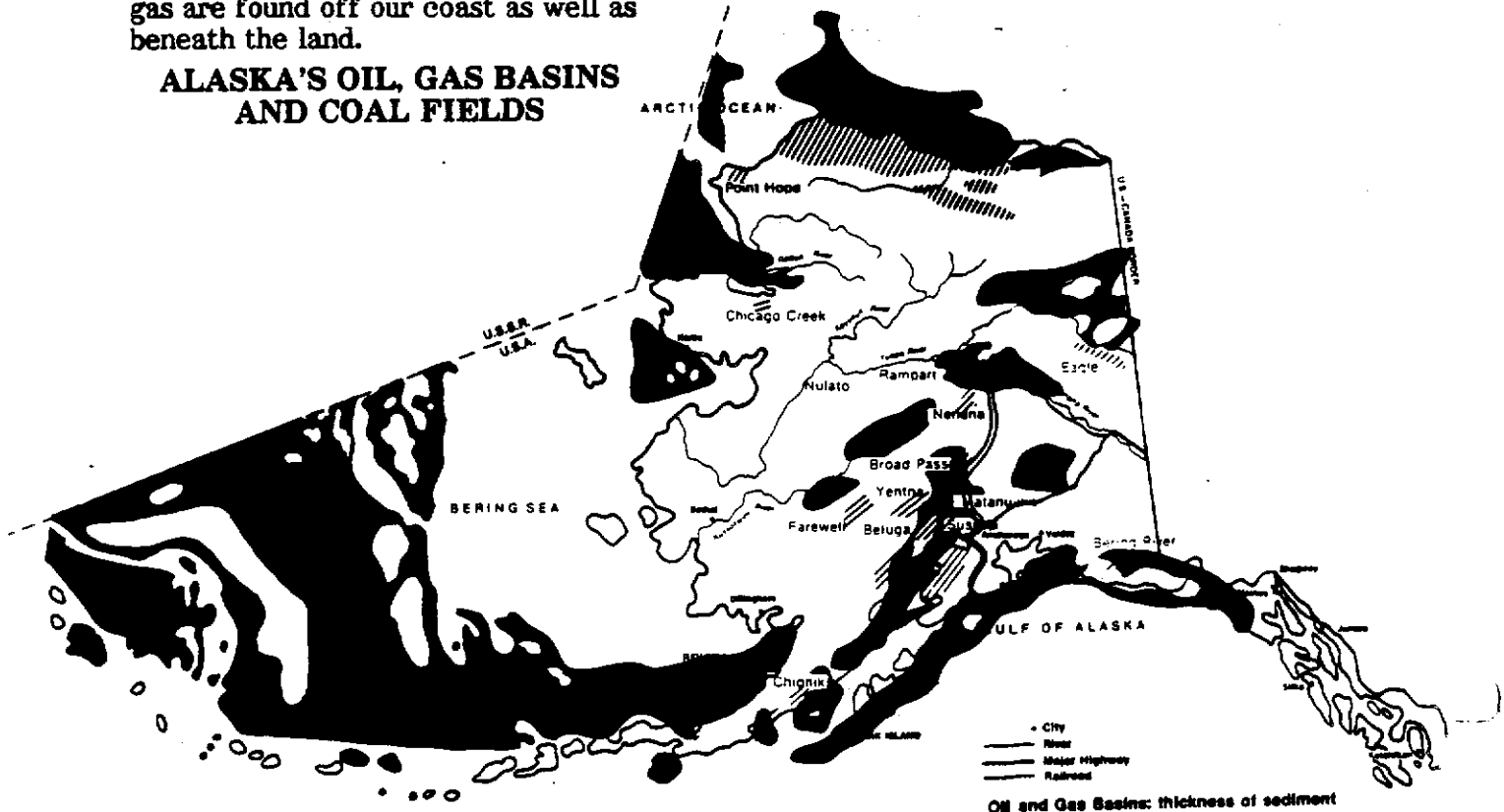
Mineral deposits are spread throughout the state, as this map shows.

ALASKA'S MINERAL DEPOSITS



The map below shows that Alaska's oil and gas are found off our coast as well as beneath the land.

ALASKA'S OIL, GAS BASINS AND COAL FIELDS



WHAT ARE SOME KINDS OF MINING THAT OCCUR IN ALASKA?

Before any mine can be developed the ore must be found. **Ore** is rock from which a valuable mineral resource can be mined or removed for profit. The Eskimos who found oil seeps in the Arctic and the bush pilot who noticed "Big Sore" on Admiralty were part of the explorers. There are many geologists working today in Alaska to discover more mineral deposits. They are working on the exploration phase.

When a mineral is discovered, a decision may be made to produce and sell the mineral. In this development phase, the site and the access to site are built. If there are no roads to the mineral deposit, roads must be built. Other things that may need to be built could include air fields, pipelines, railroads, harbors, power plants, power lines, and buildings. Special equipment must be purchased and shipped to the mine site. Development costs are very expensive in Alaska, because of the lack of transportation facilities like roads, railroads, and ports.

The next phase is production, when the mineral is extracted from the earth and prepared for further processing. Metals like gold, copper, zinc, coal and molybdenum are produced from mines. Oil and gas are produced from wells.

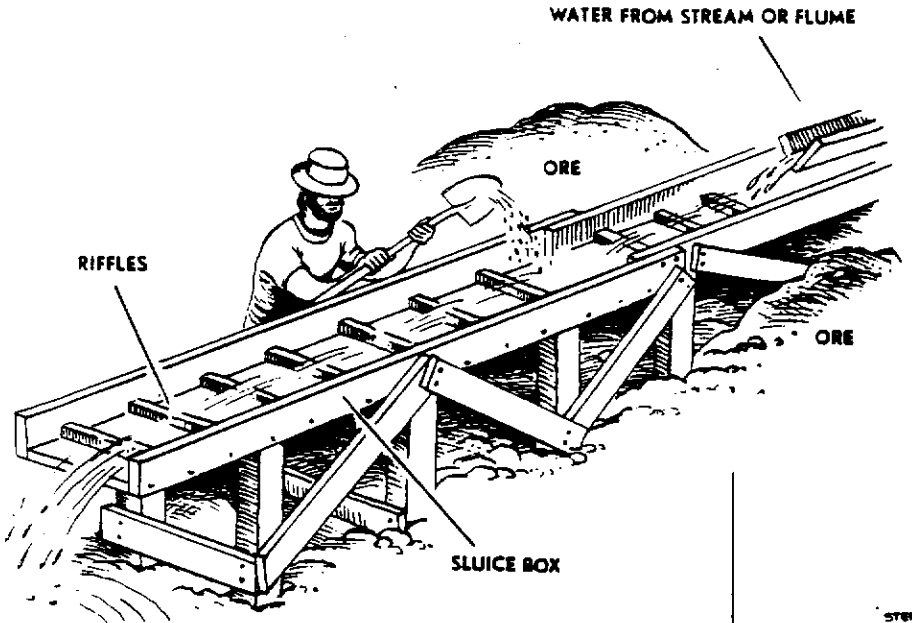
There are two kinds of mines; surface mines and underground mines. When a mineral or coal deposit is located at or very near the surface, it can be mined by digging a pit or large hole. The Usibelli coal mine near Healy is an example of a kind of surface mining called strip mining. With huge machines, the topsoil and other material over the ore body are removed and stored, then the ore is mined. After mining, the topsoil is replaced and replanted to approximate the previous contours of the land.

Another kind of surface mine, the placer mine, is used by many prospectors. **Placer deposits** are found in sand and gravel that have been washed down from nearby mountains. Instead of removing ore from the bedrock, stream gravels are dug up. They are washed and examined closely for gold or other minerals that can be placer mined, like silver, platinum, tin, tungsten, and diamonds.

The early Alaskan gold miners didn't have bulldozers or heavy earthmoving equipment to help them mine gold, so they often used drift or hydraulic mining.

Drift mining was usually done during the winter in placer deposits too deep to be mined in other ways. Miners went down into a shaft dug into the frozen ground. Once the miners reached the bottom of the shaft, they would drift along the boundary between the bedrock and the river gravel. This is where most of the gold was found. Because the gravel was frozen, it had to be thawed before men could shovel it. Pipes were driven into the hard frozen gravel by the miners and steam hoses were connected to the pipes. The hoses carried steam from a boiler located in a building on the surface.

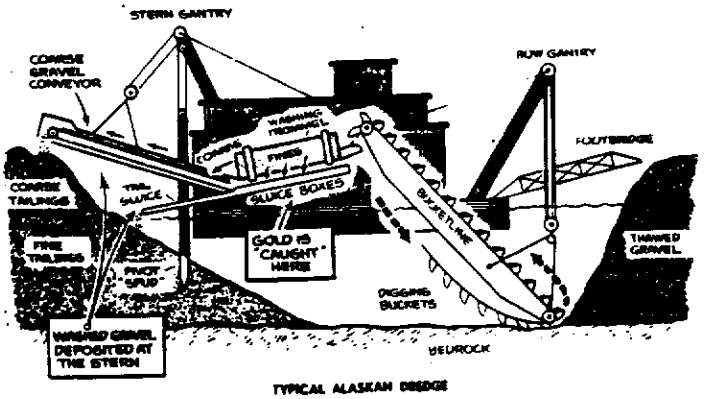
Once the hot steam thawed the gravel, the miners could shovel it in wheelbarrows and wheel it to the bottom of the shaft. There it could be dumped into a bucket and lifted to the surface. The gravel would be put in a pile called a dump. In the spring the dump would be run through a **sluice box** to recover the gold. Sluice boxes and gold pans work in similar ways, catching gold or other heavy and valuable minerals like silver, platinum, tin, and tungsten. Since the minerals are much heavier than normal rocks, they settle to the bottom of the gold pan or in the riffles of the sluice box. The lighter materials, called **tailings**, are carried off by the water running through the box or pan.



If the placer deposit was close to the surface, early miners could use high pressure water nozzles called "giants" to move the gravel and mine the gold. This method was called hydraulic mining, after the water used in the hoses. To get water, miners often dug long ditches by hand to bring the water to their mines. To get enough pressure for the "giants," the ditches had to be much higher than the mine. The "giants" were connected by pipelines to the water in the ditches.

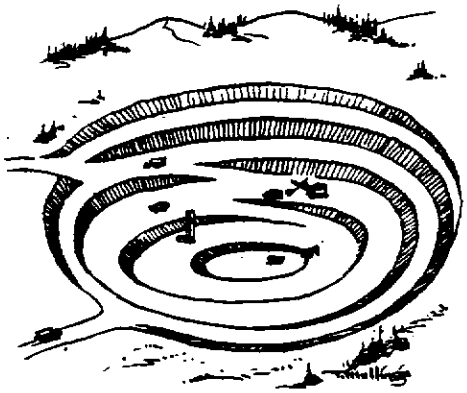
The miners used the high pressure streams of water from the "giants" to push gravel into the sluice box. The nozzles were also used to push aside tailings that came out of the sluice box. Unlike drift mining that was done in winter, hydraulic mining could only be done in the summer when water was flowing.

Today placer miners use heavy equipment to overcome the problems, of early miners. The deep gravels that had to be mined from underground can be mined today using bulldozers and draglines that dig deep holes. This equipment also takes the place of the "giants" that were used to move gravel in hydraulic mining. Huge dredges have played a part in mining, especially in the Interior, but they are rarely used today. Regardless of how the rock is moved, modern placer miners still use sluice boxes to catch the gold, just as the early drift and hydraulic miners did.



TYPICAL ALASKAN DREDGE

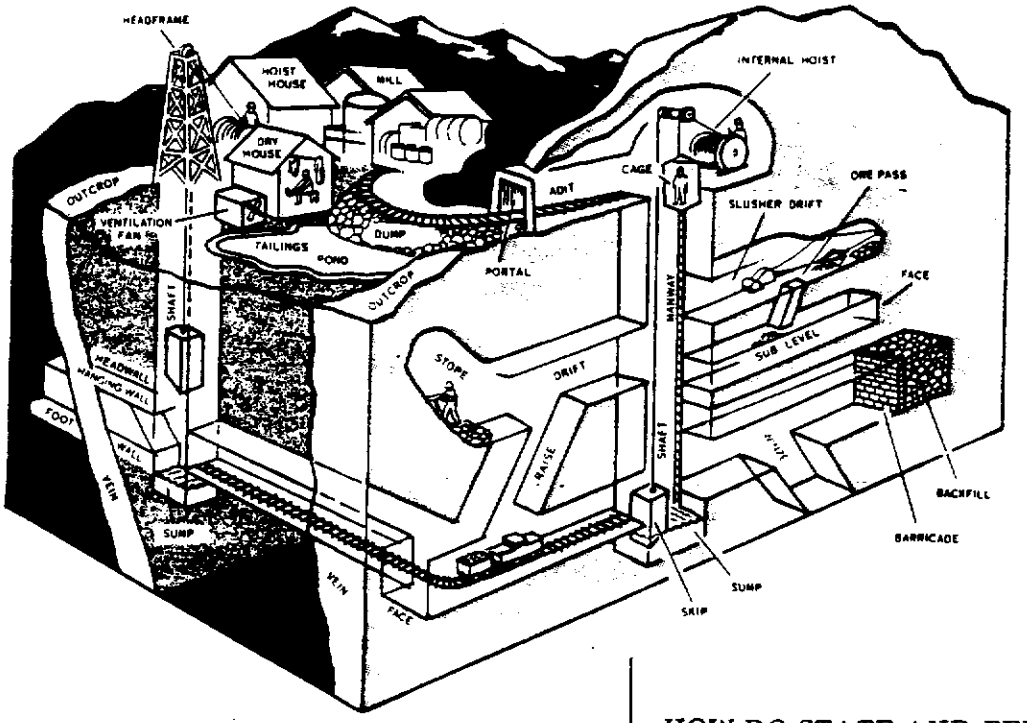
Mineral found in veins is called **lode.** Lode mining, or **hard rock mining,** is the method of extracting mineral-bearing ore out of solid rock. Ore may be taken from an open pit or underground mine. Open pit mines are simply large holes in the earth, usually with roads circling them.



Underground mines have tunnels and shafts to reach the ore, which is sometimes deep beneath the surface. Pages 80-91 in The Alaskans shows scenes on the ground level of the Alaska-Treadwell Mine, one of the most famous mines of its day. The Treadwell mines and most other underground mines are similar to this cross section.

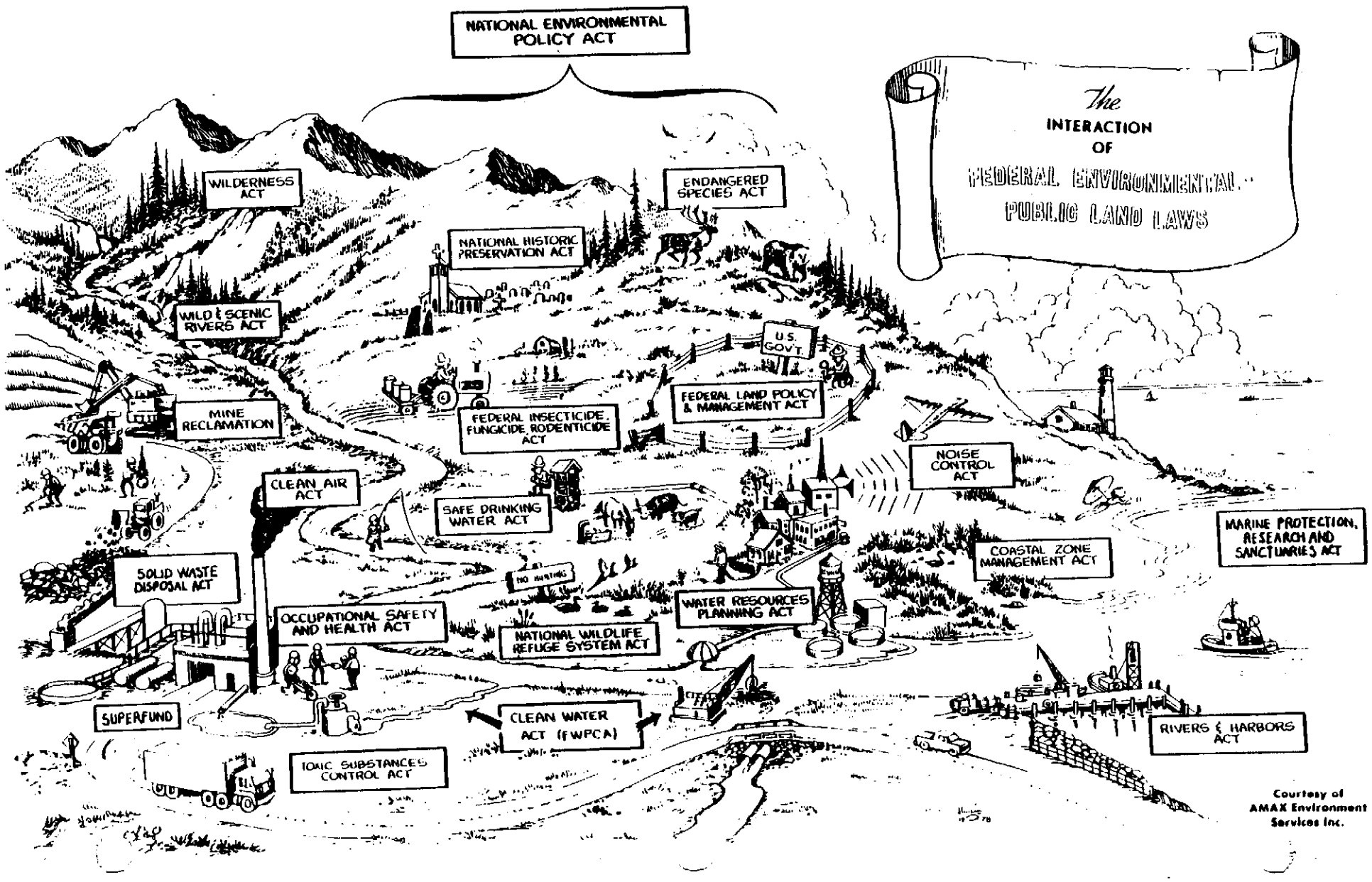
Usually it costs less to extract ore from a surface mine than from an underground mine. Mining is also a dangerous profession, involving backbreaking labor.

CROSS SECTION OF AN UNDERGROUND MINE and SURFACE BUILDINGS



HOW DO STATE AND FEDERAL REGULATIONS AFFECT ALASKA'S MINERAL RESOURCES?

The following chart will give you some idea of the many regulations that must be followed whenever public lands are used for any resource.


NATIONAL ENVIRONMENTAL POLICY ACT
The INTERACTION OF FEDERAL ENVIRONMENTAL - PUBLIC LAND LAWS
WILDERNESS ACT
ENDANGERED SPECIES ACT
NATIONAL HISTORIC PRESERVATION ACT
WILD & SCENIC RIVERS ACT
U.S. GOV'T.
FEDERAL LAND POLICY & MANAGEMENT ACT
MINE RECLAMATION
FEDERAL INSECTICIDE, FUNGICIDE, RODENTICIDE ACT
NOISE CONTROL ACT
CLEAN AIR ACT
SAFE DRINKING WATER ACT
MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT
COASTAL ZONE MANAGEMENT ACT
SOLID WASTE DISPOSAL ACT
NO HUNTING
WATER RESOURCES PLANNING ACT
OCCUPATIONAL SAFETY AND HEALTH ACT
NATIONAL WILDLIFE REFUGE SYSTEM ACT
SUPERFUND
CLEAN WATER ACT (FWPCA)
RIVERS & HARBORS ACT
TOXIC SUBSTANCES CONTROL ACT
Courtesy of AMAX Environment Services Inc.

Alaska has always been exploited for its resources. The laws enacted serve to protect the mineral resources as well as the environment. Read "National Petroleum Reserve" in the AA. This will explain how one law affects our resources. Some of the recent issues affected by state and federal regulations are the opening on the Arctic National Wildlife Refuge to oil exploration, the monitoring of the Greens Creek Mine, which is located within a national monument, and the clean water regulations that are affecting placer mining in the Interior.

HOW DOES THE ALASKA PETROLEUM INDUSTRY AFFECT ALASKA'S WEALTH, DEVELOPMENT, AND LIFESTYLE?

The "oil boom" first hit Alaska in the 1970's, when many workers came to Alaska to build the pipeline. Many of those workers stayed and became residents, while others took their pay and left. When the pipeline began operations in 1978, many people were employed to maintain and run it. Oil companies constructed large corporate offices within the state to monitor their pipeline interests. Because of the oil boom, Alaska also experienced a construction boom to provide housing and other buildings.

State government received a giant boost in the form of royalties paid by the oil companies for the oil they extracted. Part of those royalties have gone into a Permanent Fund, established in 1978. Other money that the state received went toward capital and operating budgets of the state. Capital money is spent on new construction projects. With capital money, many communities had their first chance to receive services that others in America have long taken for granted, like low-cost power, water and sewage systems, roads, and harbor facilities. Many new school districts were formed, bringing local high schools to bush students for the first time.

Operating budgets pay for the services provided by the state government, the salaries of all the workers, and the expenses for all the departments of the state government. Some examples of departments are Fish and Game, Health and Social Services, Education, and Public Safety. With more population, and more funds to deal with the needs of the state residents, many services were expanded.

Alaska's oil boom has matured. With the drop in the price of oil, available funds have dropped. Many people have lost jobs and left Alaska, leaving unfinished homes and businesses as well as empty buildings. Alaska now has less money to spend on capital projects and state services, and is undergoing the painful process of budget cutting.

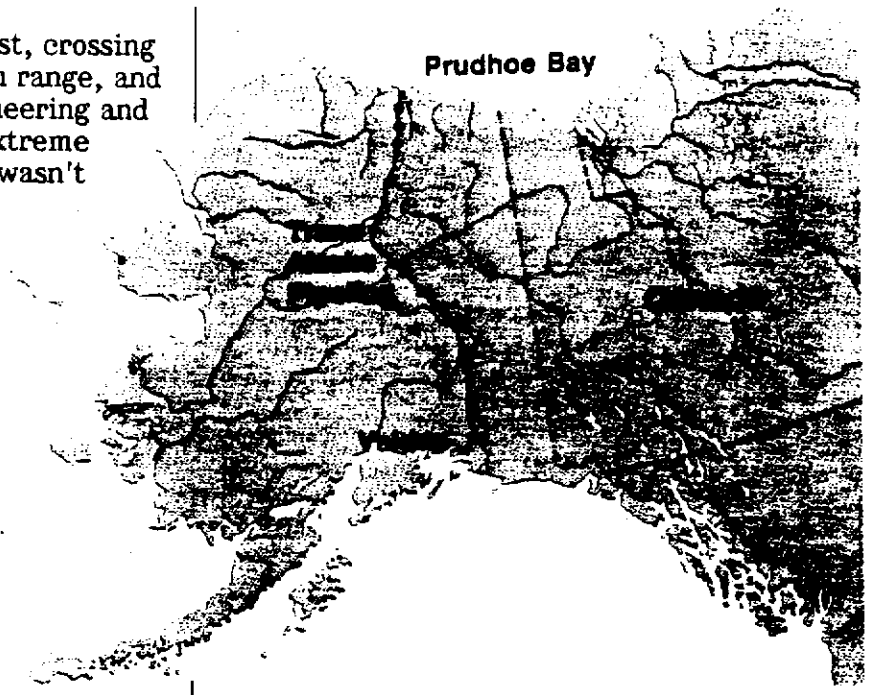
The petroleum industry has affected every Alaskan in some way. How has it affected you?

WHAT WERE SOME GEOGRAPHIC CONSIDERATIONS INVOLVED IN DETERMINING THE ROUTE OF THE ALASKA PIPELINE?

The problem with the Prudhoe Bay oil discovery is that the oil was so far from market. One possible solution was to build large ice-breaking tanker ships that would sail through the ice packs of the Arctic Ocean to carry the oil to market. This was deemed potentially too harmful to the environment. As a second option, oil companies had to figure out how to get the oil to an ice-free, deep water port, so oil tankers could transport it to market. The most feasible port was 800 miles away, in the Prince William Sound town of Valdez. The only way to get the oil there was by pipeline.

The Pruhdoe Bay-Valdez pipeline was the largest privately financed construction project ever attempted. Many engineers felt it wasn't possible to construct such a

line, given distance, permafrost, crossing three major faults, a mountain range, and innumerable rivers. The engineering and construction technology for extreme temperatures and permafrost wasn't available.



TRANS ALASKA PIPELINE
Courtesy of
Atlantic Richfield Company

Those building the pipeline had to discover many techniques and processes themselves. Read more about the pipeline on page 189 of PGA or read "Pipeline" in your AA.

HOW IS PRUDHOE BAY OIL EXTRACTED AND MARKETED?

To get oil from the Prudhoe Bay field, gravel pads first had to be built offshore in the Beaufort Sea. The wells were drilled from these artificial islands, and the oil piped along causeways from the islands to storage tanks. Oil is preheated before it enters the pipeline and is helped on its 800-mile journey by "pigs," which are solid objects that travel at intervals through the line. Assisting the movement of oil as well are pump stations, built at intervals along the length of the pipeline.

Once the oil reaches Valdez, it is loaded onto huge tankers and shipped to refineries farther south in the United States.

Although the small portion of oil the State of Alaska receives as royalty can be sold to anyone, the Oil Export Administration Act prohibits private companies, from selling oil to foreign countries, so the vast majority of the Prudhoe Bay oil ends up in the domestic market.

You have learned a little bit about the minerals that are extracted in Alaska, but this lesson has just scratched the surface. In order to dig deeper, you might want to read Alaska's Oil/Gas and Minerals Industry, an Alaska Geographic publication, or any of the other sources listed for this lesson.

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 2.12

Mineral Research Projects

Here are several projects that you may want to research. Choose one, then use a variety of sources to learn about your topic, like interviews, newspapers, books, magazines, videotapes, and letters. Choose any you like to report on your findings: poster, pamphlet, audiotape, videotape, or written report.

1. "Boom or Bust"
   Investigate the affect of the pipeline on Valdez. Why was Valdez selected as as the pipeline terminus? Identify two points of view about the impact the pipeline has had on the state. Support the two points of view through role playing. (You may use costume, audiotape, etc.)

2. Mining History of _____
   Many Alaskan communities share a chapter in Alaska's mining history. If your community does, it should be interesting for you to explore its history. You are also at liberty to select another community. Write a short report that chronicles the town's mining history. Be sure to describe the town's historical development as it is connected to its mining history.

3. Environmental Safeguards
   Every mining industry affects the environment, and safeguards are put in place to protect it. Choose one mineral and an extraction method used for it. Investigate the environmental problems that this mining method presents, and describe the safeguards and regulations that protect the land. Is there a controversy surrounding this mining method? (One example is the Interior placer gold mining and the clean water standards they must meet.)

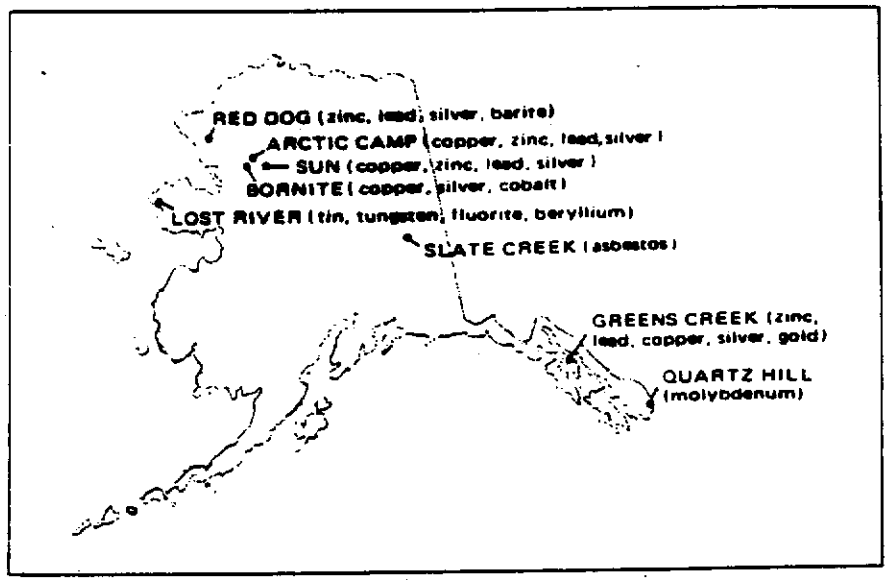
4. Economic importance of mineral resources.
   Choose at least five minerals that are extracted in Alaska. Research the importance of these minerals and mining industries to the Alaskan economy. Show your results on an illustrated chart.

5. Prudhoe Bay
   Investigate the geologic processes that created this oil-field. Do some research on the oil drilling and extraction process at Prudhoe Bay. Describe the outlook for this major oil deposit.

Mineral Research Projects

6. New Mining Ventures

   There are several new mining ventures, among which are Greens Creek, Quartz Hill and Red Dog. Become an expert on one of these or another of your choice. Report to your class or Advisory Teacher in some way.



EXTENSION ACTIVITY 2 — 2.12

Alaska Coal: Videotape

MATERIALS:

VCR
Monitor
Videotape: " Alaska Coal"

TO DO:

After watching the videotape, complete more research about the Usibelli Coal Mine. If you have no other resources available, the Mine can be reached at this address:

Usibelli Coal Mine, Inc.
Pouch 1
Healy, Alaska 99743

Prepare a report of some kind that answers one of the following questions:

What process and machinery are used to mine coal at the Usibelli Coal Mine.

What are the present and future markets for the Usibelli coal?

What reclamation efforts have been most successful, and how have these efforts affected the environment?

EXTENSION ACTIVITY 3 — 2.12

Mining Field Trip

Alaska is so rich in minerals that there are working mines, mine ruins, or mining museums scattered throughout our state. Visit one such resource in your area and prepare a videotape or photographic report on what you learned about mining.

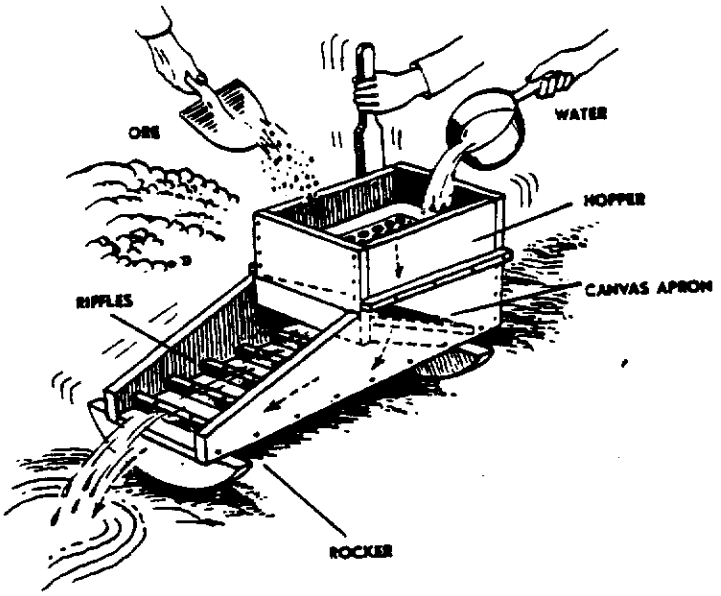
EXTENSION ACTIVITY 4 2.12

Mining Legends

In 1867 a man named Fred Culver was found floating with a poke (bag of gold) in a canoe in Taku Harbor, 12 miles south of present-day Juneau. He was nearly dead from starvation and wounds inflicted by the Tlingit Indians.

He told of finding a seam of gold with his two partners. When his partners were killed, he fled, leaving behind his rocker. This is a cradle-like device that uses a little water to separate gold out of the sand and gravel.

And so the legend was born of the Lost Rocker Mine. Many men have searched for it, but no one has ever been certain of having found it.



TO DO:

Have you ever heard any legends about lost mines in your area? Find out more about the Lost Rocker Mine or find someone in your community who knows a mining legend. If you can't find a person, use books or other resources to find out about at least one legend in your community or in Alaska. Examine the legend for details. Are there any details that make you think the legend could or could not be true?

Prepare a creative writing of a legend of your own.

Prepare a map of the possible legend location.

EXTENSION ACTIVITY 6 2.12

Prospecting Alaska

TO DO:

Riz Bigelow has been involved in minerals exploration in Alaska for some time. Read his story, "Prospecting Alaska," pages 88–117 in Alaska's Oil/Gas and Minerals Industry, Alaska Geographic, Volume 9, Number 4/1982.

Now contact the U.S. Geological Survey or the Alaska Division of Mining Geological and Geophysical Survey to learn more about mineral exploration in Alaska. With their assistance, find the name of someone presently in the field of mineral exploration whom you can interview.

Prepare a list of questions you would like to have answered about mineral exploration in your area or throughout Alaska. Use these questions while interviewing.

Record your interview on audiotape or videotape.

EXTENSION ACTIVITY 7 2.12

***US! Oil Spill: Alaska's Big Spill**

MATERIAL:

VCR and monitor
Glass bowl
Various objects (rocks, feathers, wood chips, etc.)
water
vegetable oil

Videotape: "US! Oil Spill: Alaska's Big Spill"

Before Watching the Program:

In a clear, glass bowl of water, add a small amount of vegetable oil and note what happens to the oil. Does it mix with the water? If not, does it sink to the bottom or float to the top? Now try to remove the oil from the water. List the methods you try and how well they worked.

During the Program:

Using the "pause" function of your VCR, jot down definitions for the following terms as they are presented in the program:

Containment
Environmental Conservation
Hydroblast
S.O.S.
Crude oil
Fathom
Obliterate

***US! Oil Spill: Alaska's Big Spill**

MATERIAL:

After the program:
Choose two of the following.

1. Valdez is the main oil tanker terminal. Estimate how many tankers travel to and from Valdez in a year. Figure how many gallons of oil one tanker holds, and calculate how much oil is shipped out of Valdez each year. This information can be obtained from Mr. Lyle Von Bargen, Community Relations Supervisor of the Public Affairs Office of Alyeska. c/o Box 512, Valdez, AK 99686. Send a copy of your letter to your teacher.

2. What actually happens physically to the fish, birds and other living things caught in an oil spill? Collect an assortment of materials such as feathers, rocks, small plants, paper, etc; dip each of these in a small amount of oil, coating each well. Now try to clean the oil off completely, without damaging the object. Identify some of the best materials to use in cleaning the objects. Write up the results of this experiment in a short report for your teacher. Include "before" and "after" photographs of the objects if possible.

3. Several different professions were mentioned in this program. List each and describe the role each profession had in the oil clean-up.

4. List possible precautions which can be taken to prevent future spills.

5. Research how waste motor oil is disposed of in your community. Do you think this is a proper method of disposal? Brainstorm several proper waste oil disposal methods which could be used in your community.

*On March 24, 1989, the oil tanker, Exxon Valdez, spilled close to 11 million gallons of crude oil into Prince William sound. The Anchorage Daily News carried the oil spill as a daily headline for over a month. You may find these articles on microfiche in your local library or perhaps your school or family kept articles. At this time a video production concerning the impact and implications of the Valdez oil spill is in production.

ALASKA TRIVIA 2.12

Minerals and You

Our bodies are made of minerals, too! Here are approximate percentages for the minerals in your body and the selling price for each mineral based on 1985 estimates. Using your weight, compute the percent of your weight for each mineral. Multiply by the selling price of the mineral. How much are your body's minerals worth?

MINERAL	% of How Much you Weigh	Mineral Selling Price Per Pound	Mineral Value $ of your body
Oxygen - 65%	_____	$0.976	_____
Carbon - 18%	_____	.75	_____
Hydrogen - 10%	_____	30.85	_____
Nitrogen - 3%	_____	1.31	_____
Phosphorus - 1%	_____	0.017	_____
Potassium - .35%	_____	0.07	_____
Sulfur - .25%	_____	0.80	_____
Chlorine - .15%	_____	.50	_____
Sodium - .15%	_____	1.48	_____
Magnesium - .05%	_____	0.837	_____
Iron - .004%	_____	1.25%	_____
Other - .046%	_____	_____	_____
Molybdenum	_____	3.72	_____
Manganese	_____	0.80	_____
Aluminum	_____	0.815	_____
Iodine	_____	11.20	_____
Copper	_____	0.68	_____
Nickel	_____	3.29	_____
Fluorine	_____	53.67	_____
Zinc	_____	0.44	_____
Arsenic	_____	.40	_____
Bromine	_____	4.00	_____
Tin	_____	6.35	_____

How much are your minerals worth?_____

Unit 2, Lesson 13 People As A Resource

Here is Lesson 13, which discusses one of our most important resources, Alaska's people.

It will take you 2 or 3 class periods to complete the minimum requirements.

Coming up: Look through the activities for Lesson 16 to see if you need to order supplies or materials.

Warm-up: Complete this first.	☐ Your Opinions, p. 313
Information: Complete this next.	☐ People as a Resource, p. 317-319
Extension Activities: Complete at least one of your choice.	☐ 1. Last Frontier, interviews, p. 320* ☐ 2. Local Hire Laws, research, p. 321* ☐ 3. Alaska--As Strong As Its People, writing, p. 321* ☐ 4. Alaska Entrepreneur, research, p. 321* ☐ 5. Whose Responsibility? writing, p. 321* ☐ 6. New Postage Stamp, writing, p. 322* ☐ 7. Special Alaskans, writing, p. 322* ☐ 8. You Are an Alaskan Resource, writing, p. 322* ☐ 9. The World of Work, p. 322* ☐ 10. Alaska Sketches, video, p. 323* ☐ 11. Post-Secondary Schools, computer, p. 324* *May be sent via e-mail if student has access.
Sourdough Lingo:* Complete this as you study the lesson.	☐ List at least five words from this lesson with which you are unfamiliar. Define them.
Alaska Trivia:* Optional	☐ Alaskans in Sports, p. 325
Assessment:	☐ Review the objectives for Lessons 12 and 13. Then complete Assessment 4. See page 327.

WARM-UP 2.13

Your Opinions

The focus of this lesson is Alaska's people.

The following writings were created by past students of Alaska Studies. Each one touches on the ideals of why Alaska is "the Last Frontier."

Read and enjoy.

Letter to a Prospective Alaskan

Dear Dave,

I recieved your letter and I can understand why you are getting tired of crowds and pressure from different people. I can imagine how difficult it is to find work you like and to stay out of trouble. If you move up here to Fairbanks or Anchorage, you may find work but life would be pretty much the same with similar problems, only it's colder.

Out here life would be very different and you'd probably either like it a lot as I do or you'd not like it at all. In summer you may get a job selling gas and fixing tires at the lodge or you might be put on with one of the miners. Otherwise you can mine for yourself which may be a lot of work for very little or a lot of work for a bunch. People vary in what they like to do. We like to mine, but my Mom can hardly wait to push rocks with a shovel and I'm bored to sleep at the box. Yet I like working the equipment and my Mom thinks she's falling over a cliff everytime she takes the cat over a bump. You'd just have to see what you like to do.

In winter there is no one to work for, there is only us and one man through April, and mail comes in by plane once a week. If you want to go to town you'll have to fly out or snow machine 120 miles to Tok. There are no shows, T.V., arcades, bowling, parties, or the recreation you are used to. The only girl in miles and miles is my eight-year-old sister.

Our recreation is also our work, but the fact that it is necessary doesn't make it less relaxing or enjoyable. In the fall we hunt for our meat. Finding the game and shooting it is the easy part. Then comes the work of getting it in, cleaning, skinning, and butchering it. Once we have our meat, our hunting is done with binoculars or a camera.

We keep busy with getting wood, hauling water, snow or ice, and with school. I trap in the winter, which is really a lot of work but I love it. Last year my line was 20 miles because I started it on foot, but next year I want to extend it to 100 miles. I plan to run it in a combintion of ways, snowmachine, dog sled, and cross country ski's with pack dogs.

Our fun may seem pretty tame to you. It's simple things like getting out for walks and snow machine rides, camping out, working and playing with the dogs and cat, going up for mail, getting some special food in, playing cards, and reading. You'd better do a lot of thinking before taking on a winter up here. We're usually at least 10 degrees colder than Fairbanks going from +15 degrees to -65 degrees and averaging -15 degrees. You'd

better like snow because we have it from September until June. We get a few hours of light all winter but we lose the sun in November and don't get it back until February. The winter goes by quickly, peacefully, and happily if you are prepared for it and if you like it. If you aren't or don't it will really be tough! Only you can think it all out and look into yourself to see if this is the life you want. If and when you decide please let me know if I can be of any help.

Your friend,
Flint

My First Silver

I've lived the last five years of my life down in Minnesota. Didn't do much fishing, but the fishing I did I sure enjoyed. Never caught much to really talk about, a few northerns, some small sunnys, like I said, nothing to talk about. I'd never even had the pleasure of catching some bass or trout. All I ever used was one of those Zebco rod and reel combinations. That was until I came to Alaska.

I came up to Alaska the end of June to spend some time with my Dad and Gramma and Stepmom. I took an immediate interest in Alaska. The mountains just awed me, and they still do. The scenery is like none I've seen before, and I've seen a lot of scenery. Then the wildlife, that just blew me away. Then the fish, now thats what I like about Alaska. I caught my first trout, and boy are they the fightingest fish I've ever seen. Then the salmon, now there's a fish.

The first time I saw salmon, they were spawning. They were reds and they were starting to turn. I couldn't believe it, the whole river was full of them! I watched them slipping by, my eyes bigger than saucers and getting bigger all the time. Right then I wanted to catch one so bad. I did later.

We were camping at a place the natives call "the hole" on the Kenai river one day back in August. The reds had been rolling through the day we got there, but none of us were having any luck. At the end of the day we finally quit fishing and made a campfire. We sat around eating dinner and enjoying the warmth of the fire for a while till my cousin Tim and my dad hit the hay. I stayed up and fed the fire and listened to music till about 2 a.m.

It was beginning to get a little light so I went down to the river to check for salmon. Once in a while I would hear a splash that would sound out of place so I knew that the salmon were in.

At 3 a.m. I went and woke up my dad and my cousin, but they weren't getting up for anything. So I decided that I would go and try for some salmon myself.

By then it was totally light and I could see the river clearly. I was lazily casting my salmon rod and letting tons of line out while enjoying the early morning sun. Suddenly my rod acted as if it was possesssed, almost bending in two. It was so sudden and unexpected that the only thing I could do was automatically jerk back on the pole, trying to set the hook in that hard-mouthed salmon. Just as suddenly the line started going out with a loud ZZZZZZZZ. I frantically tried to adjust the drag and after a minute I got it just right, not to loose and not too hard. I slowly began to reel in a small fraction

of the line that the salmon had taken from me. I still hadn't sighted the fish I was trying so hard to keep on my line. I realized I had way too much line out. So I started running along the bank, reeling in as I ran. I can remember slipping and falling numerous times, stopping many times to jerk back on the pole, making sure he was still hooked good. Once in a while I would hear the familar sound of line whipping out as the salmon made another lunge for freedom.

As I ran around a bend in the river I saw my salmon for the first time. It was leaping out of the water when I caught my first glimpse of him. You know when artists paint a fish in the middle of a spectacular leap? Well, that's how I first saw my fish, not in a magazine, but in real life with me holding onto him for dear life.

By then he was only about thirty feet away from me, and boy was he fighting! He was jumping out of the water and fighting that hook with all his might and life blood. Me, I was fighting hard just to stay on my feet. I was slowly reeling in little by little though, walking forward and fighting that fish as I went. He never did give up though, fighting the last couple of feet all he could. As I reached down and tried to pick him he gave one last effort and splashed cold Kenai River water all over me. He seemed to say in that last instant "We're still the king of the river, you may get me butthere's thousands just like me who will make it"

I picked him up and gave him his death blow as my cousin Tim came up. He asked "Is it a silver?" "Yep, sure is...My first silver."

That day as we cooked up the huge fillet of meat, I knew Alaska was the state for me. My silver was about 12 to 14 pounds, biggest fish I'd ever caught in my life. I was proud of that fish, mighty proud. He sure was a fighter, fought till his last breath. That day I felt real good. I'd just caught my first silver.

THE RUSH FOR THE BUSH

The Klondike Gold Rush,
Brought many sled-dogs-a-mush,
But most arrived in vain,
Because more than a year before they came,
And rotten luck was blamed.

SOAPY SMITH, THE CORPSE

Soapy Smith was a con and a cheat,
There was hardly a game at which he could be beat,
And then came a surveyor, Frank Reid,
And to Soapy's whereabouts, he got a lead,
And he did a great deed,
And just what the town did need,
The riddance of Soapy Smith, the weed.

SEAL HUNTING

Many a hunter got many a seal,
So they invented a machine for the pelt, to make it peal,
And then the seals began to deplete,
And boatowners had to lessen their fleet,
Just to pay the debts at their feet.
Our government, instead, let a company make the loot,
But they had to protect each and every Aleut,
Which was hard, since there was no international control,
And the hunting of seals took its toll,
And it ws harder to reach their quota goal.

OBJECTIVES 2.13

People as a Resource

Here's what you will be studying in lesson 13. Upon completion you should be able to answer these questions:

How are human resources important to Alaska's development?

How does education increase Alaska's human potential?

What are the post-secondary education opportunities in Alaska?

How is local hire emphasized in Alaska?

What brings people to Alaska's "Last Frontier?"

People as a Resource

HOW ARE HUMAN RESOURCES IMPORTANT TO ALASKA'S DEVELOPMENT?

Alaska's development is the story of Alaska's people. From the earliest times, when tales of adventure were told in Native homes during the long winter nights, the resources that were developed and the events that have shaped our present Alaska were set in motion. Through knowledge, skill, daring, endurance, luck, and lots of hard work, the people of Alaska have shaped a great state.

During this course, and in other ways, you will have learned about many of the famous persons who made enormous contributions to the State of Alaska. Many Alaskans are familiar with such figures as Judge James Wickersham, Chief Cowee, Alexander Baranov, Carl Ben Eielson, and Howard Rock. There are many unsung heroes as well. They are the thousands of people, both Native and immigrant, who made their communities a better place to live.

Each Alaskan today has that same potential. Some have education and expertise in fields that are in demand. Others are leaders, helping to govern their community, village, town, or state. Many Alaskans take pride in completing their jobs to the best of their ability, and contribute to the common good in that way.

Alaska, like the rest of the U.S., is a melting pot of people of different races and ethnic origins. Many of the migrations to Alaska were sparked by economics. For example, many Chinese, Japanese, and Filipinos first came to Alaska to work in canneries.

Many Scandinavians immigrated because they were accustomed to the northern climate and the occupations of fishing and cool-weather farming. Lapps arrived to establish reindeer herds.

Many Alaskans with Russian names are descendents of the people who once governed Alaska. Look around your community. Are there many people with a similar ethnic background? How did they happen to settle in your area?

HOW DOES EDUCATION INCREASE ALASKA'S HUMAN POTENTIAL?

In earlier times, the skills and education necessary to make a living were taught by relatives and friends in Native villages. The lifestyle was one of subsistence, and highly technical occupations to earn money were unknown. With the influx of people from other countries and parts of America, the economy became more complex, and the kinds of education necessary to survive also changed. It became necessary to teach Alaskans new skills and give them the information they need to function in the changed society.

One of the earliest pioneers in the field of education in Alaska, and the first General Agent for Education, was Rev. Sheldon Jackson. Read about Rev. Jackson in The Alaskans, pages 65-70. You'll find that education was a rather hit-and-miss affair, taken care of by missionaries and the companies who had stations in Alaska.

You'll also find that Rev. Jackson had unique ways of providing education in this huge state with the tiny amount of funds provided by the U.S. government.

In the early 1900's, towns were allowed to incorporate for the first time, and they began to provide schools for their young people.

The U.S. Bureau of Education provided schools for children who lived outside incorporated towns. There were also boarding schools for Native children that were run by missionary organizations. A Territorial Board of Education was first organized in 1915, and has evolved into the present-day State Board of Education.

In 1931, the Bureau of Indian Affairs took over the operation of rural schools from the Bureau of Education. Other rural schools were provided for by the State Operated School system. The general pattern of education at this time was for elementary education to be provided in each village. For high school education, most students were required to attend regional boarding schools. One such school was Beltz High School at Nome. Other Native students were sent to BIA boarding schools in the Lower 48. Because students were gone from their village, and from the support structure it provided, their drop-out rate was very high.

In 1972, Alaska Legal Services sued the State of Alaska on behalf of Molly Hootch. Molly had to attend school in Anchorage because there was no high school in her village of Emmonak. The suit charged that boarding schools and correspondence courses did not provide the same education as attending high school in the student's home community. When in 1976, the State of Alaska agreed that villages should have their own high schools, it began immediately constructing high schools in local villages. Since the advent of village high schools, there has been a large increase in the number of students completing high school.

Read about the present status of education in Alaska in the selections in your *Alaska Almanac* called "Education" and "School Districts."

What are the post-secondary education opportunities in Alaska?

Your *Alaska Almanac* describes post-secondary education opportunities in the selection called "Universities and Colleges." In addition to universities and colleges offering degrees, there are many opportunities for technical training as well. A part of the Department of Education called the Alaska Commission on Post Secondary Education offers student loans and financial aid for Alaskan students who want to pursue education beyond high school.

HOW IS LOCAL HIRE EMPHASIZED IN ALASKA?

The pattern of industry and resource development in Alaska has traditionally been one of importing education and expertise to fill Alaskan jobs. In an attempt to save Alaskan jobs for Alaskans, the state passed a local hire law that required employers to give jobs to qualified Alaskans before offering them to non-residents. That law was declared unconstitutional by the Alaska Supreme Court.

Since then, although there is no local hire law on the books, both the private and public sectors have been encouraged to hire locally. This means that Alaskans, as a whole, are offered jobs within the state before jobs are offered to others in the United States. In some small villages, the local hire emphasis is carried even further. The definition of "local" refers to persons residing in the village, not in Alaska. In many construction jobs, the money from the project is shared by many village families when eligible workers are given "turns" at the job. Instead of hiring one construction worker for the duration of the job, several workers are hired, each for a portion of the construction period. The money from the construction project is thus spread throughout many families in the village.

In order that Alaskans be qualified for job opportunities within the state, they must be educated. The Department of Education operates a Career Information System that is available for local high schools.

By using this system, students can find out not only the kinds of careers for which they are suited, but the job outlook for those careers as well. This helps students make intelligent decisions about the kinds of training to seek.

WHAT BRINGS PEOPLE TO ALASKA'S "LAST FRONTIER?"

The United States was built on a "frontier" ethic by people who were adventurous enough to leave their homes and strike out to seek their fortune in the new, unexplored territory to the west. The frontier, and the pioneering it made possible, have been vital components in the creation of the American character and culture. When in 1890 the United States Census announced that the American frontier no longer existed, wilderness no longer was seen as the enemy, but an essential component of the intellectual vigor of Americans.

It was natural that Americans began to look north to Alaska as the region where frontier was still available. Adventurers like John Muir and Jack London published writings that popularized Alaska as the last frontier. Remote, mysterious, and wild Alaska seemed to be the only place left where people could still be pioneers.

People still head north for Alaska in hopes of finding wilderness, adventure, and a better life. In spite of the many changes in Alaska in the past two decades, it is still a land of magnificent scenery and wilderness that offers opportunity to those who can meet the challenge.

TO DO: LEARNING LOG

Follow the instructions from the introduction on preparing your journals for this course. 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 2.13

Last Frontier

BACKGROUND:

You have read that Alaska is regarded as the Last Frontier. What kinds of people would be attracted to a state known as the "Last Frontier?" How would that influence the kinds of knowledge and skills available in our human resource potential?

TO DO:

Find at least five people who have come to Alaska within the last 30 years, or whose families have come to Alaska within the last 30 years. Interview them on audiotape or videotape, or take notes if no recorders are available. The questions you will ask should be similar to these.

Why did you come to Alaska?

What do you especially like about Alaska?

What made you stay in Alaska?

What contributions have you made as a human resource to the State of Alaska?

After you have conducted your interviews, synthesize your results and use them to answer the following question.

"How does the impression of "Alaska as the Last Frontier" affect our human resource potential?"

You can report on your answer using any method you choose. This includes audiotape, videotape, posters, charts, graphs, or written essays.

EXTENSION ACTIVITY 2 — 2.13

Local Hire Laws

TO DO:

In previous years it was common for outsiders to travel to Alaska, exploit its resources, make their fortune, then leave the state and the problems they created behind. To guard against this recurrence, the State of Alaska would like to ensure that the resources are harvested for the benefit of Alaskans, and that Alaskans get the jobs created by this resource development. Local hire is one way to remedy this historical situation.

Research the background of the local hire issue and the laws created because of it. Good places to begin are your library or the Alaska Department of Labor. When you have become an expert on this issue, give a report of some kind that explains the background and history of local hire for Alaskans.

EXTENSION ACTIVITY 3 — 2.13

Alaska--as strong as its people

Write a reaction paper to the statement. "Alaska can only be as strong as its people." Be sure to support your opinions and tell why you hold the opinions that you do. Your paper should be at least two pages in length.

EXTENSION ACTIVITY 4 — 2.13

Alaska Entrepreneur

Explore the meaning of the word "entrepreneur." Identify some of Alaska's entrepreneurs and the enterprises with which they were associated. Select one that impresses you and write a profile of the individual's life and business success.

EXTENSION ACTIVITY 5 — 2.13

Government and Individual Responsibility

Create an imaginary conversation between two people. One person holds the view that "the government should guarantee that every individual who wants to work should have a job." The other person feels that "it is every individual's responsibility for his/her employment, education, resources." End your conversaton with the individual whose opinion you support having the last word.

EXTENSION ACTIVITY 6 — 2.13

New Postage Stamp

The U.S. Government is about to issue a new stamp commemorating a notable woman in Alaska's history. A meeting has been called in which several people will present a speech nominating someone for this honor. You have an opportunity to make a speech in support of a candidate you feel deserves to receive recognition. Provide a written copy of your speech and a design of the stamp.

EXTENSION ACTIVITY 7 — 2.13

Special Alaskans

Create a booklet dedicated to Special Alaskans (men, women, Natives and non-natives). Your booklet should feature satements of their contributions to our state, when and where they lived or present home, notable quotes if possible, and a brief account of their lives and influences. A minimum of three people should be featured.

EXTENSION ACTIVITY 8 — 2.13

You are an Alaska Resource

Describe what you will be doing 10 years from now. Tell how you achieved the goals you set, what education or training you may have received, what job you are performing, and how are you contributing as a human resource? (At least two pages)

EXTENSION ACTIVITY 9 — 2.13

The World of Work

Choose an Alaskan workplace and a job about which you would like to learn more. Jot down impressions you have of both, then research the workplace and the work. Let your research lead you to the answers to the following questions.

How does the location affect work conditions?
Would the work be possible in any other location?
How does the location affect the style of living of the workers?
What is the nature of the work?
What goes on during a typical workday?

Pretend you have worked a summer at this job. Write a first person account.

EXTENSION ACTIVITY 10 2.13

Alaska Sketches

MATERIAL:

VCR and monitor

Videotape: "Alaskan Stetches" Program 1, Rie Munoz, Program 2, Ted Gerkin, Program 3, Paul Ongtooguk, Program 4, Jimmy Phillips

Before the Program:

1. Define "successful" as you perceive it. What would make you a "successful" person? Now look the word up in the dictionary. Does this change your perception of the term?

2. Make a list of people you consider successful. How many women are on your list?

3. Watch at least two of the programs:

After the program: Complete two of the following that relate to the tapes you watched.

1. Rie Munoz is a successful artist. List the characteristics she possesses which may have contributed to her success.

2. Ted Gerkin is a business man who has held several jobs in the course of his life. Make a list of the jobs you have held so far and those which you think you would be qualified for if you were seeking employment. Make a list of the jobs you would like to explore.

3. Paul Ongtooguk's path to success was not easy. He encountered racial discrimination, frequent moves, and growing up without his mother. Write a brief paper about a problem you encountered and overcame, or one through which you helped a friend. (Please use a ficticious name for your friend.)

4. Jimmy Phillips has been successful in the commercial fishing industry. Make a list of the specialized skills that a commercial fisherman may have to develop in order to cope with increased competition or danger. Can these be learned in school? Make a list of things you do well which you did not learn in school.

EXTENSION ACTIVITY 11 2.13

Post-Secondary Schools

MATERIALS:

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

TO DO:

BEFORE:

1. Load Appleworks and Activity 6 on Data Disk #1 into the computer.
2. Print out a copy of Activity 6.

DURING:

Compose a letter using Appleworks to one of the post secondary institutions requesting information about educational opportunities at the school. Create a file, POSTSEC, on Data Disk #1 for your letter.

AFTER:

Print out a copy of your letter and send it to the post secondary institution you have chosen to write to.

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 2.13

Alaskans in Sports

1. What Native sport did Reggie Joule set ten world records in between 1971 and 1984?

2. What are USS's school colors?

3. Who was the first Alaskan to make the U.S. Olympic track team?

4. What musher won a record tenth World Championship in 1982?

5. Who was the first woman to win the Iditarod?

6. Who was the first musher to win the North American and World Championship races the same year?

7. What part of the body is stressed with 16 pound weights in a World Eskimo-Indian Olympics competition?

8. What Golden Gloves boxing champion of 1940 became governor of Alaska?

9. What is the State Trooper's S.O.M.E. Run?

10. What did Alaska State Senator John Binkley ride from Barrow to the tip of South American?

ASSESSMENT 4 (Lessons 12-13) 2.13

You have completed Lessons 12-13. 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 4 in his or her test packet. Your home teacher must monitor you while you are completing Assessment 4.

CHECKLIST 2.14

Assessment 5 (Lesson 14–15)

Name _____

Date _____

You will need to send the following to your advisory teacher after completing Lessons 14–15, Assessment 5, and the Mid-Term Exam.

___ **Mid-Term Exam**

___ **Assessment 5**

Lesson 14

___ Learning Log

___ 1 Extension Activity (list)

___ _____

___ Sourdough Lingo

Lesson 15

___ Learning Log

___ 1 Extension Activity (list)

___ _____

___ Sourdough Lingo

Unit 2, Lesson 14 Getting Around Alaska

Here is Lesson 14, which discusses transportation in Alaska.

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

Coming up: Look through the activities for Lesson 18 to see if you need to order supplies or materials.

Warm-up: Complete this first.	☐ Wind Chill, p. 333
Information: Complete this next.	☐ Getting Around Our State, pp. 335-38
Extension Activities: Complete one activity of your choice.	☐ 1. Everyday Life, research, p. 339* ☐ 2. Travel Tales, writing, art, photography, p. 341* ☐ 3. Iditarod Activities, p. 342 ☐ 4. Alaska's Future Transportation, writing, p. 355* ☐ 5. President Harding, writing, p. 355*. ☐ 6. Women in Aviation, writing, p. 355* ☐ 7. Personal Opinion, writing, p. 356* ☐ 8. Hovercrafts, ATV's, Kayaks, video, p. 356* ☐ 9. Extended Reading*: "Lifeline to the Yukon," B. Anderson; "Baidarka," G. Dyson; "The Alaska Rail-Road," E. Fitch; "Pioneer Bush Pilot," I. Harkey; "Land of the Fireweed," H. Morrett; "The Crooked Road," D.A. Remley; "Wager With the Wind: The Don Sheldon Story"; "Railroad in the Clouds," W. Wilson; "Alaska Steam," Alaska Geographic Society *May be sent in via e-mail if student has access.
Sourdough Lingo*: Complete this as you study the lesson.	☐ "The Bush" Alaska Marine Highway Alaska Highway The Iditarod
Alaska Trivia*: Optional	☐ Pilot, Pilot, Everywhere, p. 357
Assessment:	Are you keeping up with your objectives?

Wind Chill

The human body loses heat to cold air. The rate of loss depends upon the amount of clothing and the air speed. In air that is the same temperature as the body, the rate of loss is 0. Heat loss increases as the temperature decreases or as the wind speed increases. If a musher rides on his sled at a speed of 5 mph in calm air (no wind) he faces a wind chill factor like a person standing still in a 5 mph wind. Proper clothing protects the body from extreme wind and cold.

WIND SPEED MILES HOUR	COOLING POWER OF WIND EXPRESSED AS "EQUIVALENT CHILL TEMPERATURE"																			
	TEMPERATURE (°F)																			
CALM	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60
	EQUIVALENT CHILL TEMPERATURE																			
5	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-65	-70
10	30	20	15	10	5	0	-10	-15	-20	-25	-35	-40	-45	-50	-60	-65	-70	-75	-80	-90	-95
15	25	15	10	0	-5	-10	-20	-25	-30	-40	-45	-50	-60	-65	-70	-80	-85	-90	-100	-105	-110
20	20	10	5	0	-10	-15	-25	-30	-35	-45	-50	-60	-65	-75	-80	-85	-95	-100	-110	-115	-120
25	15	10	0	-5	-15	-20	-30	-35	-45	-50	-60	-65	-75	-80	-90	-95	-105	-110	-120	-125	-135
30	10	5	0	-10	-20	-25	-30	-40	-50	-55	-65	-70	-80	-85	-95	-100	-110	-115	-125	-130	-140
35	10	5	-5	-10	-20	-30	-35	-40	-50	-60	-65	-75	-80	-90	-100	-105	-115	-120	-130	-135	-145
40	10	0	-5	-15	-20	-30	-35	-45	-55	-60	-70	-75	-85	-95	-100	-110	-115	-125	-130	-140	-150
WINDS ABOVE 40 HAVE LITTLE ADDITIONAL EFFECT	LITTLE DANGER					INCREASING DANGER							GREAT DANGER								

Answer the following questions with the aid of the chart.

1. A checker is waiting for mushers to come at the Rohn River checkpoint and there is no wind. The temperature is 10 degrees F. There is no wind chill factor so the checker must dress for the temperatures of _____ degrees F to stay warm.

2. A racer approaches the checkpoint. The wind is not blowing but the racer is going 10 mph. The temperature is still 10 degrees F. The racer must dress for weather of _____ degrees F to stay warm.

3. A wind of 10 mph starts to blow on the checker while the temperature remains the same. Now the checker must put on more clothes to protect him from temperatures of _____ degrees F.

4. A racer approaches the checkpoint. The 10 mph wind is blowing into his face. He is moving at a speed of 10 mph. He must dress for a temperature of _____ degrees F to stay warm.

OBJECTIVES 2.14

Getting Around our State

How have transportation modes changed throughout Alaskan history?

What are some of the transportation systems in Alaska today?

What are the economic and social effects of transportation systems on your community?

How do subsidies affect transportation in our state?

How does Alaskan geography influence the types of transportation we use?

How do transportation costs affect product prices?

What are some future transportation alternatives?

Getting Around our State

HOW HAVE TRANSPORTATION MODES CHANGED THROUGHOUT ALASKAN HISTORY?

The long, heavily-laden cedar canoe approached the shore of the village that is now Craig, Alaska. It was summer, the time of the fish camps. The young lookout on the shore beat on his drum to signal visitors to his people. When the canoe was nearly to shore, it paused while the headman asked formal permission of the people on the beach to set up his summer fish camp there. His people had traveled from their permanent village to this area on the only roads available at the time - the waterways.

Rivers have been important routes of travel in Alaska for thousands of years. Alaskan Natives used birch bark canoes and skin boats in the summer. During the winter, they walked or mushed dogs on or along the rivers. Trade routes to the interior were trails that followed river valleys and mountain passes. Early explorers followed the rivers. Later the gold miners and traders traveled on the rivers, especially the Yukon, to reach the goldfields. Rivers were the earliest "roads."

Rivers don't travel in nice straight lines, though. They follow the easiest path. Rivers have many curves in them.

For the Russian and Euro-American explorers and adventures, the route to Alaska was by sea. Sea travel, along with some river travel, was the only means of getting from one place to another in Alaska for many years.

The earliest ships were sailing ships, and the explorers took advantage of the skillfully crafted Native boats for travel on rivers or in sheltered areas of the ocean.

Ocean shipping remained Alaska's only link with the rest of the United States when it was purchased in 1867. Navigation in Alaskan waters was and continues to be very dangerous, but it wasn't until 45 years after Americans took over Alaska that the first two permanent lighthouses on Alaska's coast were erected. The Klondike gold strikes caused the first shipping boom to Alaska. Steamships were used between Alaska the two primary ports serving the gold rushers - Seattle and San Francisco. For the first time, it was important to haul a lot of poundage and passengers on the rivers, especially the Yukon, and the first steam paddlewheelers appeared.

As new areas of mineral exploration and production opened up, other transportation means were begun. The old Native trading trail from the head of Lynn Canal over the mountains to the headwaters of the Yukon became the famous Chilkoot Trail, over which thousands of eager gold-seekers traveled.

Railroads were also tried as a form of transportation, but they failed to have the effect of "opening up" Alaska as they had done in the western United States. Still in operation is the Alaska Railroad, running from Anchorage to Fairbanks.

The dogsled was the primary way of traveling Alaska's trails. Dogs could haul large loads over long distances in the wintertime, when snow and cold kept the trails covered and frozen. This was the common method of communication, supply, and mail delivery for many areas in Alaska. Probably the most famous delivery of all occured in 1925 when mushers relayed diptheria serum from Nenana over the Iditarod Trail to Nome to avert an epidemic.

Read "Iditarod" in your Alaska Almanac to learn about the race that commemorates this lifesaving delivery.

More trails were needed for overland travel from ice-free ports to the Yukon River.

One of the first trails constructed was the Valdez to Eagle trail. Used only by packhorses in its first years, it was later widened and improved . Today it is one of the major highways in Alaska, the Richardson Highway.

Even though land and sea transportation had been improved over earlier years, the vast distances in Alaska still made travel between centers of population difficult and time consuming. A sign of times to come appeared in Fairbanks in 1913, when James and Lilly Martin demonstrated their airplane. They shipped their plane to Fairbanks, unpacked it, made five flights in three days, and since they had no buyers, they packed it up again to be shipped home to San Francisco.

It wasn't until after World War I, during which many improvements were made on airplanes, that flying became important for Alaska. In 1924, Fairbanks high school science teacher and pilot Carl Ben Eielson tried flying the mail from Fairbanks to McGrath. Imagine the surprise of McGrath residents, who received in several hours mail that ordinarily took as long as three weeks to deliver by dog team! The first scheduled airline was also begun in 1924 in Fairbanks by Noel Wein. Two years earlier, Roy F. Jones began commercial air service in Southeast in a surplus World War I navy flying boat. That was the start of the fabled "Alaskan bush pilot." We all know that air travel is the glue that holds Alaska together now. Read about "Air Travel" in the AA.

The sea, which was the most important travel corridor in earliest times, remains important. Containerized and roll-on/roll-off vessels make loading and unloading quicker than on ships that were conventionally loaded. The majority of life's necessities--food, clothing, and shelter--are shipped in by boat.

For getting from one place to another, Alaskans rely on air travel. Alaskans take a plane like others take a bus or taxi.

While many parts of Southcentral and the Interior have a road system, land transportation remains relatively unimportant in Alaska.

WHAT ARE SOME OF THE TRANSPORTATION SYSTEMS IN ALASKA TODAY?

Alaskans travel and transport goods by ship, barge, highway, train, air. Pages 152-155 in DGA give you a summary of several transportation systems in use today in Alaska. Read the sections on "Boating, Bus Lines, **Alaska Highway,** Dalton Highway, Ferries, Highway, Railroads, and Shipping" in your Alaska Almanac to learn of other transportation systems. In addition to these, you could probably list several other methods used by Alaskans to transport people or goods over land, sea, or air. Some examples are dogsleds, snow machines, all-terrain vehicles (ATV), small boats, and helicopters.

WHAT ARE THE ECONOMIC AND SOCIAL EFFECTS OF TRANSPORTATION SYSTEMS ON YOUR COMMUNITY?

A family in Angoon puts their car on the **Alaska Marine Highway** "turnaround" ferry LeConte for the trip to Sitka. While the ferry remains in Sitka, they buy many groceries and supplies, then catch the LeConte back to Angoon with their provisions.

Tourists conveniently fly to Fort Yukon on one of several scheduled airlines, the local Native corporation built a new hotel to serve them, and provides jobs for the community.

A Juneau family starts a new smoked salmon business catering to the many tourists who find it easy to visit Juneau by cruise ship, ferry, or scheduled airline.

The examples above are just a few of the effects of transportation systems that have been felt by some of the Alaskan communities. Every community in Alaska has experienced change of some sort in recent years because of developments in transportation. Some effects are good, like increased access to supplies and medical attention. Improved transportation systems often bring visitors to local communities, and businesses are developed to cater to those tourists.

It is easier to visit friends and relatives who live elsewhere.

Some of the less desirable changes have to do with opening up an area to many others. Where previously, a family may have had exclusive rights to an area because of its isolation, new transportation modes have made it accessible to others.

HOW DO SUBSIDIES AFFECT TRANSPORTATION IN OUR STATE?

Subsidies are amounts of money paid, usually by the government, to offset costs. We have previously discussed timber subsidies, where the U.S. Forest Service is given federal money to provide roads for timber companies. There are also subsidies given to some transportation systems. A major airline is given a subsidy to provide jet service to several small communities in southeast Alaska who otherwise would not generate enough passenger or freight to justify the airline stopping there. What will happen to jet transportation in those communities when the subsidies are removed?

The Alaska Marine Highway is funded by the Alaska Legislature to provide service to small communities that otherwise would not receive dependable ferry or freight service. What would happen if that funding was cut? The advantage of subsidies is that communities are given dependable, affordable transportation service. Can you think of disadvantages to subsidies? Who pays for the subsidy, and what is the long term effect of subsidies on competition and business efficiency? Are there transportation systems that are subsidized in your community?

HOW DOES ALASKAN GEOGRAPHY INFLUENCE THE TYPES OF TRANSPORTATION WE USE?

Probably the biggest influence on our transportation system is the vastness of our state. This makes flying very desirable, since airplanes can cover more distance in a shorter time than any other form of travel. The second geographical factor that influences our transportation systems is the proximity of the ocean or rivers to many of our communities.

Southeast Alaska, with its myriad of islands, and its opposite borders of oceans and ice-covered mountain ranges, depends heavily on water transportation. Anchorage is an important seaport for supplies that are then transported by rail or highway to many other parts of the state. Even the far north is supplied heavily by barge and shipping service, although there is only a short period of time when the Arctic waters are ice-free.

Land transportation corridors evolved around (and sometimes in spite of) the geologic obstacles presented by the mountain ranges, rivers, glaciers, faults, permafrost, and muskeg. River valleys were used for most routes. These are now the routes of the Alaska Railroad, the highways, and trails.

HOW DO TRANSPORTATION COSTS AFFECT PRODUCT PRICES?

Because we are so far removed from the Lower 48 and other countries that supply our goods, the things we buy cost more than they would in a comparable store Outside. The reason for this is the higher transportation costs.

One of the first things you must decide when placing a catalog order or mailing a package is whether you want to go by boat or air. Shipping prices differ greatly between surface and air transportation. Even though more than 90 percent of our goods arrives on sea-going vessels, some materials are flown in at a much greater cost. Most families order with enough time in mind so that sea or ground transportation can be used to deliver the product. That makes the cost less.

Because products from Outside cost more due to transportation costs, that gives an added advantage to Alaskans who produce items used to supply food, clothing, or shelter. They can afford to have higher operating costs than comparable companies Outside, because they do not have to pay the higher transportation costs necessary to get their materials to the Alaska marketplace. In the near future we may see more products manufactured here in Alaska for Alaska markets.

WHAT ARE SOME FUTURE TRANSPORTATION ALTERNATIVES?

One of the obvious developments in the transportation field will be more improvements in the transportation systems now in use. Jets that are made of lighter materials and are more fuel efficient will be cheaper to fly than today's. Similar improvements will be made for boats, trucks, cars, and even trains.

Within the large cities of Fairbanks and Anchorage, monorails or skytrains may someday become cost-efficient.

Hydrofoil ships have been tested by the Alaska Marine Highway system, and while they are not being used at this time, there may be a time in the future when there will be enough passenger and freight business to make them profitable. Other new developments in sea-going vessels include large, powerful catamarans, some of which are being used now.

New engines and fuels will point the way to other transportation alternatives that are not known today. Just as early Alaskans adjusted to new and better modes of transportation, so will the new generation of Alaskans.

TO DO: LEARNING LOG

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

2. What do you still want to know? *

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

EXTENSION ACTIVITY 1 2.14

Everyday Life

How do geography and transportation affect your everyday life?

What have you wanted to buy for yourself lately? You have saved your money and you want the best for your budget; new clothes, basketball shoes, stereo, tape deck, car, bike, snow-go, jewelry, furniture.

Choose one item and investigate the different modes of transportation involved in getting that item to your home. See the map on the following page.

If you have to order it:

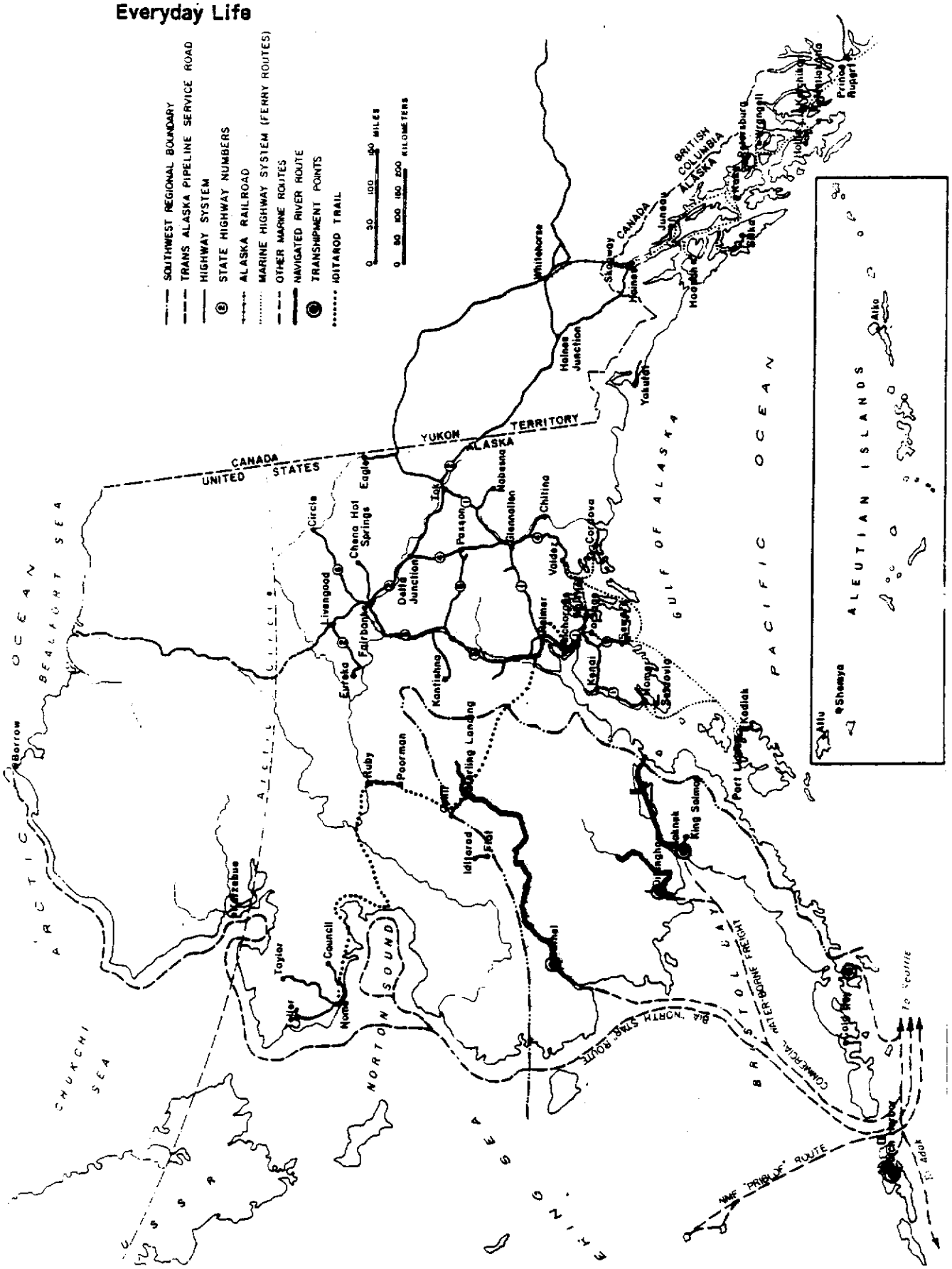
Does it come from out of state? From where does it come?
How much does the shipping cost?
How long would it take for you to receive your order?
Trace the transportation route to your home. How many systems of transportation are involved? List and name them. (Even if it is just by air from Anchorage to your home, list all the different airlines involved.)

If you do not have to order it:

Investigate through the store owner/manager or sales person the same questions as above.

EXTENSION ACTIVITY 1 (continued)

Everyday Life



EXTENSION ACTIVITY 2 2.14

Travel Tales

Story Writing Poetry Photography Artwork

Suggested subjects are: favorite trips, a funny incident, a scary happening, an exciting adventure, a mysterious event, animals riding on board, animals seen on the trip, loading time, unloading time, noises, smells, sense of feeling, favorite places to sit, favorite games, scenes/stories about your family, friends, or other families, the workers, their jobs, nighttime, interesting people you met, historical information, interesting facts, accidents, weather, romances, songs, etc.

The idea for TRAVEL TALES came from the ALASKAN FERRY TALES contest held in 1987. Credit goes to Dr. Marilyn Cochran Mosley, author of Dachshund Tails Up the Inside Passage and Dachshund Tails North. Joyce Delbridge, editor of Ferry Tales from the Puget Sound. Patricia Evans, writer of stories for juveniles.

Draw scenes with captions, write a story or poem, or put together a photo album with captions about true life experiences you have had on the ferry, Alaska Railroad, planes, automobiles, boat trips, dog sledding, or snow machines in Alaska.

EXTENSION ACTIVITY 3 2.14

Iditarod Activities

Read the following page, "History of the Nome Serum Run."

Do 1. and then choose 2. or 3.

1. "The original Serum Runners" Word Search

2. Read the article, "All In A Day's Work..."
by Matthew Donohoe--Northern Eye Photography
Write a letter to one of the surviving serum runners. Because of their age, the men may not be able to respond to the letters they receive. Instead of asking questions, perhaps you could share with him your thoughts and ideas about how his role, as someone who took part in one of the greatest adventure stories in Alaska's history, continues to shape the story of Alaska's history.

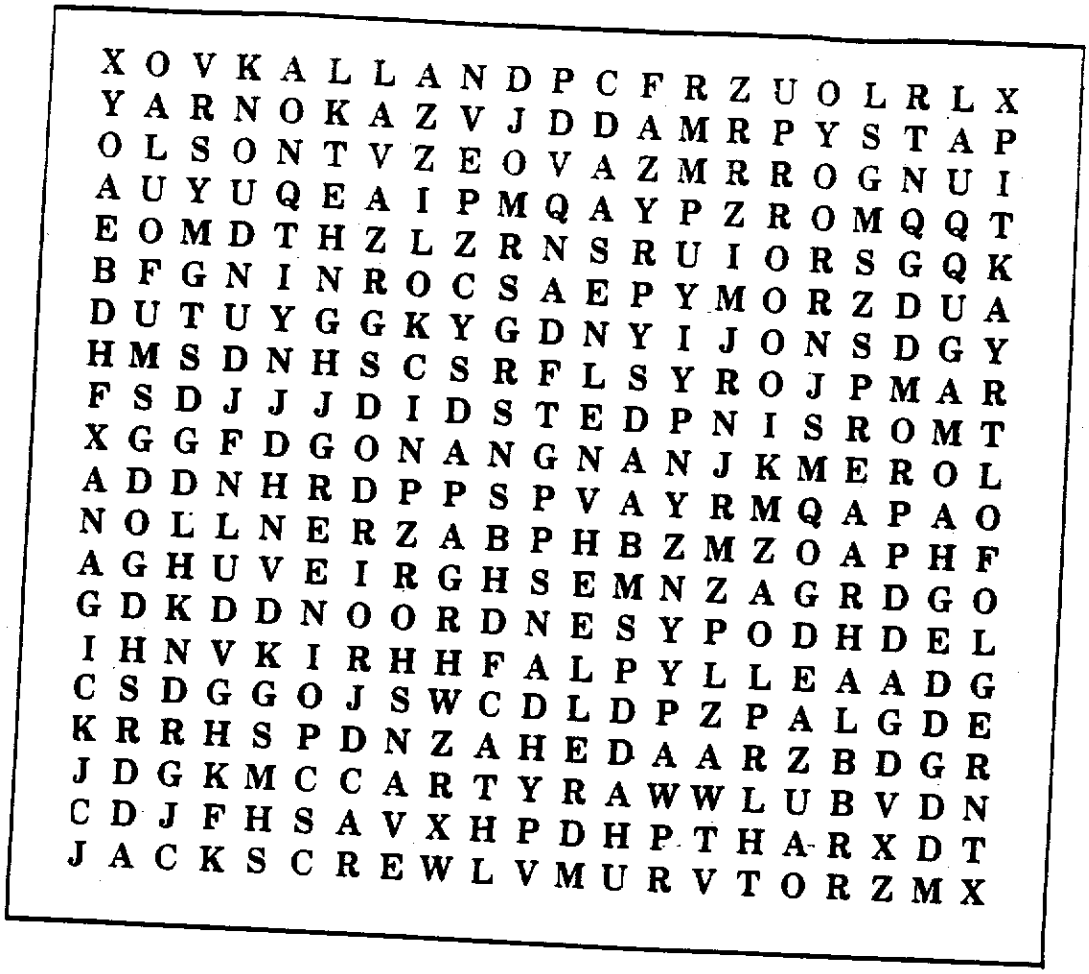
3. Mark the following features on the map of the Iditarod Trail Race Route. Use your text, Photographic Geography of Alaska as a resource.

The Alaska Range
The Kuskokwim River
The Kuskokwim Mountains
The Innoko River
The Yukon River
The Kaiyuh Mountains
The Nulato Hills
Norton Bay

Using the map of the Iditarod Trail Race Route and the map in Lesson 10, WARM-UP section, try to answer the following questions: (If you have access to an Alaska Type E Topographic May, you should use it. It should be available in your library or from the USGS office.)

How many mountain ranges does the Iditarod Trail cross?
What is the first checkpoint the mushers come to after they cross the Alaska Range?
Name the places where the mushers might run into overflow.
Name the checkpoints along the Yukon River.
Name the checkpoints along the Bering Sea.
What part of the trail do you think is the most difficult for the dogs?
Why?

THE ORIGINAL SERUM RUNNERS



X O V K A L L A N D P C F R Z U O L R L X
Y A R N O K A Z V J D D A M R P Y S T A P
O L S O N T V Z E O V A Z M R R O G N U I
A U Y U Q E A I P M Q A Y P Z R O M Q Q T
E O M D T H Z L Z R N S R U I O R S G Q K
B F G N I N R O C S A E P Y M O R Z D U A
D U T U Y G G K Y G D N Y I J O N S D G Y
H M S D N H S C S R F L S Y R O J P M A R
F S D J J J D I D S T E D P N I S R O M T
X G G F D G O N A N G N A N J K M E R O L
A D D N H R D P P S P V A Y R M Q A P A O
N O L L N E R Z A B P H B Z M Z O A P H F
A G H U V E I R G H S E M N Z A G R D G O
G D K D D N O O R D N E S Y P O D H D E L
I H N V K I R H H F A L P Y L L E A A D G
C S D G G O J S W C D L D P Z P A L G D E
K R R H S P D N Z A H E D A A R Z B D G R
J D G K M C C A R T Y R A W W L U B V D N
C D J F H S A V X H P D H P T H A R X D T
J A C K S C R E W L V M U R V T O R Z M X

Find the last names of the original serum runners.

"Wild Bill" Shannon
Dan Green
Johnny Folger
Sam Joseph
Titus Nickoli
Dave Corning
Edgar Kalland
Harry Pitka
Bill McCarty
Edgar/George Nollner
Charlie Evans
Tommy Patsy
Jackscrew
Victor Anagick
Myles Gonangnan
Leonard Seppala
Charlie Olson
Gunnar Daasen

Iditarod Activities

HISTORY OF THE NOME SERUM RUN

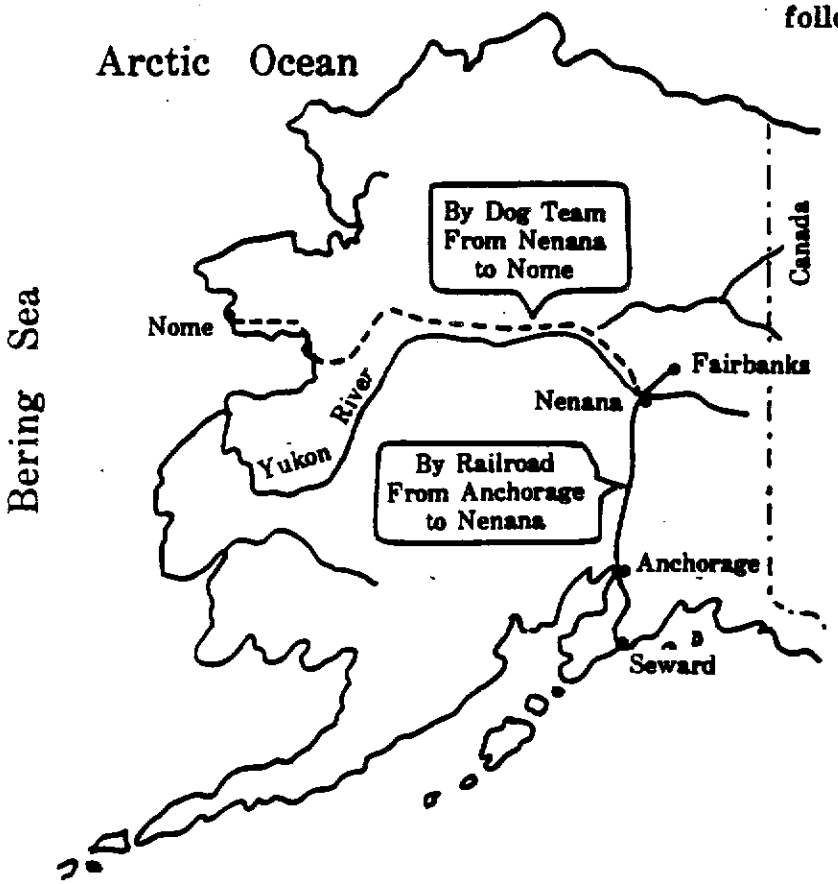
In the winter of 1925, Nome, Alaska, was struck by a serious disease called diptheria. Diptheria is a disease caused by bacteria. It infects the lungs and throats of people, and often it leads to death. The only way to stop the disease is to use a medicine called an "antitoxin" which comes as a liquid.

Nome's supply of this liquid or "serum" was getting low. The only doctor in Nome at the time was Dr. Curtis Welch. He knew how hard it would be to get a new supply of serum. Nome was on the far western coast of Alaska. The Bering Sea was frozen and no ships could get through. The planes in 1925 were not safe in cold winter weather. The only hope was to ship the serum from Anchorage to Nenana by railroad. From there it would have to travel by relays of dog sleds across the 670 miles to Nome. Mushers were already delivering mail to Nome by this route. A mail run would take almost 25 days. The mushers that took the serum to Nome knew that a 25 day delay could mean death to many of the people of Nome. Traveling day and night at record-breaking speeds, these mushers got the serum to Nome in less than one week!

The story of the Nenana-Nome serum relay was printed in newspapers all around the world. Now the Iditarod Race is held every year in honor of the original serum run. One musher on that first relay has become famous: Leonhard Seppala. The other 19 mushers deserve the same fame.

Their stories are printed on the following pages.

NOME SERUM RELAY ROUTE



ALL IN A DAY'S WORK

Mushers Recall Serum Run of 1925

The wind sweeps along the Yukon River and down the main street of Tanana which parallels the river. Sunset follows hard on the heels of sunrise. The day is short and red. Smoke streams from the chimney of the cabin as I knock on the door.

"Is Billy McCarty in?" I ask of the woman who answers. "Yes. He is my father. Won't you come in?" Billy McCarty sits at the wooden table, hands on the curve of a cane, eyes hidden behind dark glasses. He is blind. I introduce myself and ask him if he can tell me something about the old days, particularly something about the serum run of 1925. Billy smiles, a half-smile on one side of his face. The smile of a good joke, a joke from long ago and half-remembered. When he speaks, the voice is soothing and in rhythm. The smile never fades but at times it grows stronger.

Billy McCarty

"When I was about 7, a fortune teller came to Nulato. A dark-colored woman predicting fortunes. What she predicted was true. It came to pass. She told me to put my hand on the crystal ball. Then she told me I'd have lots of children and that came to pass. She said I'd never be rich but would always have enough. Nobody every passed my cabin hungry. She told me I'd have enough and it came to pass. She said I'd live to a ripe old age. I don't know about that, but one thing she said, "Beware, son," I remember that real well, "beware, son, you'll die of drowning." Ever since, in late years that water seemed to be pulling me. She predicted that James Carlo would drown and sure enough drowned that fall. She told some fellows around town that they would die and they did.

She told a woman, Martha Joe, that she would live to be an old woman and she's living yet. All that happened 60 to 65 years ago.

"My mother was from Koyukuk. We came down from Chena when I was a baby to Koyukuk. Eventually I went to Nulato. My mother died in 1912 at Nulato. The old man died at Nulato about 30 or 40 years ago. They're buried there on the bluff. One time I hired a plane, a two-seater, one being the other, open cockpit. I flew over my birthplace. I wanted to see what that place looked like. Flew around the mouth of the Chena but didn't see a damn thing except one old log building all falling down.

"I worked at every kind of work there was. I was a cook once. The Carlisle Packing Co. asked me if I could cook. I told them that I couldn't but I could try. Then there was a fellow named Frank Kerns. Ran a gas boat hauling fish. He needed a cook and a man of all trades. I went to work for him. When we came to fish camp I'd leave everything burning on the stove and count fish. They'd toss 40 king salmon and say they'd toss 60. Forty cents apiece for kings. Five cents for every other kind. People at the cannery would find out that they were being gypped but nothing ever came of it. They made so much on the fish that they never lost anything. I was cook and everything out there. Fish counter, delivery boy. I'd deliver wood to the fishermen on the river, groceries, bread. Me and another kid in our spare time would set fish nets on the cannery barge. We'd sell fish to the cannery. Did pretty good that time, for kids.

"The old man had two roadhouses on the Iditarod Trail. Before the planes came there were roadhouses strung all along the Yukon to Nome and all along the Tanana too. They were every 20 to 30 miles.

During the winter the old man would cut wood for the steam boats that ran the river. When the Iditarod stampede was on in 1908 the old man had a roadhouse 16 miles from Kaltag. The bunks would be filled up with travelers: skis, packs and horses outside. Some people who could afford it would have good dog teams. Most of the people were on foot. Once we ran out of moose meat. We had a fellow with a horse that had a broken leg. It had fallen in a crack in the ice. Had to eat that horse. It was kind of tough, but most of the people didn't notice.

"In 1917, 11 of us went down to Saint Michael to herd reindeer, I was the only one who stayed. The Lapps took two or three good looks at me and thought I'd make a good herder. The apprenticeship lasted three years. It was pretty tough, but I liked it. We had trained reindeer-herding dogs. When we got lazy the dogs would bring the herd back. I learned everything about reindeer that time. Learned'em from their hooves to their horns.

"Wolves were a problem too. There was this one Lapp, the son of Old Bear. He was pretty old himself, over 90. Wolves got lots of his reindeer one night. They grabbed 'em by the throat and killed'em. Made Old Bear's son real mad. He went after them on skis. Said he was going to kill 'em.

The son of Old Bear overtook those wolves as they were going back down the mountainside. He brought the hides back to his cabin and laid them on the floor. All night long he was drinking black coffee and roasting the devil out of 'em. Talking to 'em and cussing 'em out. The Lapps had a superstition of some sort about wolves. The son of Old Bear never went out again. I think that trip over the mountains after those wolves killed him.

He was ready to die anyway I think. I liked the son of Old Bear. They were tough, those Lapps.

"I left the Lapps after I finished my apprenticeship and went to Tanana. Later though Captain Williams offered me a job herding reindeer. I remember he wrote me for a couple of months before I went down. I went down in the spring of 1932. I walked from Kokrines to the Hot Springs. I showed Captain Willaims how to use reindeer for transportation. We hooked them up in a specially built harness, a piece of wood with a natural crook that hooked under his breast. The collar was made of wood and hooked onto the harness. Two pieces of rawhide ran along the back of his neck and were tied to the center of the harness. The other end was attached to the sled. It was simple. A deer could pull 200 pounds. At the Shaktoolik Fair my reindeer pulled 270 pounds. They had a sack of rocks that the reindeer would pull through the streets. Of course the Lapps always won. They had a fair there every winter.

"Captain Williams was using false teeth which he always kept in a jar by the stove. Every morning I'd get up to cook breakfast and there would be these false teeth looking at me. I sure got sick of those teeth. One morning I had had enough, just couldn't stand the sight of those teeth, so I put'em in a can, took'em outside and buried 'em. When Captain got up he went to put his teeth in but they were gone. That bothered him quite a bit and he got to looking around. He dug up the dirt floor of the cabin. He investigated the garbage. Captain looked everywhere but couldn't find those teeth. Finally Captain decided that he had to go to town. He got all dressed up and was getting in the boat. That's when I showed him where they were buried.

The next morning when I got up to cook breakfast, I didn't have to look at those teeth.

"It was around 1925 the time of that serum run. I was the only one around at the time who handled dogs. I used to drive the Dago Kid's team. I could take his dogs out any time I wanted to. I picked out the best of them and ran to Ruby Creek. I had a good leader and the trail was good. I met Edgar Nollner at Whiskey Creek and gave him the serum. That was about it. Years later I met a lady at the Alaska Native Service Hospital. She was in Nome that time. She came in the hospital and thanked me. It made me feel real good to know that I had done some people good. It wasn't any different than running the mail, only easier because the load was lighter. "After that I trapped on the Nowitna for 22 years. I took my outfit up there every fall by boat. Had to get two outfits, one for myself and one for the kids. We'd hunt moose on the way up. Got four or five moose every fall. That's all I could handle in the boat. We had a big boat too. Had a potlatch all winter long - Christmas to the 17th of March. Us natives, we like to potlatch.

"Things was a whole lot better in those days. Things have changed since those days something awful. I worked on the steamboats for $3 a day and had plenty. Flour cost $6 a hundred pounds. Butter was cheap then too, I think.

"Later I ran the store at Kokrines. In a way I was chief as well as store manager and agent for lots of things. Ever hear of this game called "Red Dog?" The Natives there they started a junk game. They had everything in this game, traps, rifles, dog harnesses, clothes. A couple of them came to me while the game was going on and asked me what to do because they were out of money.

Everything everybody had was in the pot. It turned out that the only one who had anything left at all was my uncle and by that he decided that he was the winner and was trying to claim the pot. When I got there I saw dog sleds, everything. Some fellows were sitting on the floor naked. Some had played for their wives and they were in the pot, too. I needed snowshoes in the worst way and there happened to be a new pair in the pot.

They also happened to belong to my uncle. I told them I would figure out what to do if they gave me that pair of snowshoes. Everybody agreed to it. Then I said for everybody to take back what belonged to them and start a new game. That made everybody happy except my uncle, because he lost that pair of snowshoes. Of course, he couldn't do anything about it because it was all agreed. They didn't play another game though; that last one cured everyone of Red Dog for a long time."

Edgar Nollner

"My dad was Alfred Nollner. He came up from Missouri. . . over Chilkoot Pass. He got to Dawson and everything was staked so he went down to Fortymile. One time he was coming down the hill by the creek. Across the creek there were two big brown bears and three cubs coming around that bend just as he was walking around this side. Big ones, too. Just keep walking, never stop or anything. The cubs they get up and look at my old man walking on the other side. They just kept going and he just kept going.
"That night it snowed five or six inches. One guy was coming over the hill from the other side when he stepped on a lump. He thought it was a lump. He stepped on it and Arrrrrrrrgh! That guy took off.

He got some guns and a bunch of them took off and they shot that brown bear. They didn't know where the other bears went to. Then they saw that guy's boot tracks after he stepped on the lump. They were a long way apart.

That guy must have been flying!
"I was born (in 1904) at Old Village about 10 miles upriver from here (Galena). From there we moved up to Laudon in 1906 and down here in 1920. I went to school till they took our school away from us and took it down to Koyukuk from Laudon. There were no kids in Koyukuk, but in the fall everybody would go up to Koyukuk to trap. There were kids then! But they had a good school up there in Laudon. Not too many kids, but we had a good school. We used to slide down from the school. Way up there on the hill we'd ski all the way down to the river.

"I got seven kids. I lost two kids to the river.

My brother got drowned down here. He was hunting geese. Went through the ice. He was crossing the river with four dogs. His sled went under, he went under. Never found him. They pulled them three dead dogs out and the sled, but my brother was gone. They brought that one dog back but he hollered and hollered so bad because he went under they had to shoot him. Every night he hollered. It was my brother's lead dog. That was in 1930.

"The time of that first serum run it was around 60 below. Couldn't see the dogs. It was dark when I left Whiskey Creek at about seven o'clock. It was dark already. I just let them go. The dogs' breathing was just like smoke. Coming down I never say nothing to them dogs, they just follow the trail. Twenty-four miles in three hours. And then I give the serum to my brother and he take it down to Bishop Mountain. Awful cold that night. No moonlight, nothing.

"Charlie Evans's dad was in charge of getting the drivers. Charlie's dad ask Monroe - he had good dogs - "do you want to take the medicine to Nulato?" Monroe says, "How much are they going to pay?" So Charlie says, "I'll borrow dogs and go." So Charlie went to Bishop Mountain and took it to Nulato that time. It was after twelve when he left Bishop Mountain. And Tom Carty took it to Kaltag.

"The run in March was different. It was warm that time. It snowed too much. Scotty Carlton was going to bring it from Whiskey Creek clear to Bishop Mountain, but he called down in the morning and said it snowed too much. "You better be ready." He said, "you'll have to take it from there down because I can't make it." As soon as he came, I took it down to Bishop Mountain. Monroe was there that time. We all got paid a little that first time, so Monroe was there. When I started back I just got in the sleeping bag. Going up the bank at Galena I woke up. Them dogs just keep going, never stop. Those were smart dogs. Seven dogs, all-male team. The lead dog was named Dixie. Those were the dogs I hauled out over 200 cords with. Half a cord every trip. I was hauling wood for the steamboat. My old man had a contract.

"They didn't have that first serum fixed that good and it froze. It was so damn cold anyway. But they used it. I guess, but they weren't sure if it was any good so they did it again. Quite a few of them died over Nome that time. In 1917 or '18, eight or nine hundred died that time in Nome. Of flu, I think. White and Native both.

Mostly Eskimos over that way. They put them in a big warehouse and set fire to it.

"That's the time at Fort Gibbons, Tanana, a bunch of soldiers was coming down on the boat. About 120 of them and one guy was playing the piano. He just got through and was going from the barge onto the boat and slipped. He got drowned. They found his body after that. And Henry Kokrine and Gregory Kokrine - they're from Tanana, I think - they were in the Army, too, and Charlie Knott. The whole bunch of them that went out, they all died except Charlie Knott and the two cousins. Died of flu.

"In 1950 I went to work on the steamboats. That time I got on a FAA boat. Charlie Evans was the captain and I was the pilot. We used to go up to Bettles, down to Marshall, Fairbanks and Lake Minchumina. I was on the boat four summers.

"They got airplanes now so there's no fooling around with freight no more. We used to haul freight up to Bettles; now they take them big planes. Today there are only tugboats down from Nenana to Marshall. They bring all the oil and heavy freight-Cats and trucks and everything.

"There used to be lots of geese on the river, but no more. They kill them all Outside by the thousands. One time this guy kill 45 ducks in five shots down there in the slough. Every time he shoot at them they just come up and they land again. There used to be lots of ducks and geese. When the geese come in the springtime, everywhere you look you see geese coming and going steady for four or five days. That was around 1918-1920. But now you see five or six flying one way and then maybe the next day you see four or five flying the other. No geese now.

"In the old days there were lots of geese. You just go a little ways and get a sled load. Nothing to it. They just keep coming in and you just shoot them. But now you see a bunch today and you might see another bunch tomorrow.

It cost me $5 to get a duck stamp to shoot ducks. Cost me $5 to shoot eight mallards this fall. I went hunting up Bishop Creek, and up the Yuki. Nothing, I just sat there and sat for nothing. Nothing to shoot at. Every lake you used to go in there used to be lots of ducks.

"One time Harry Pitka shot two ducks inside the dike. The game warden took the ducks but gave the gun back. Next time the game warden landed here everybody was shooting everywhere so he just got back in the plane and took off. Used to be lots of white geese, more than black Canadians. When they were on the ground they make noise, too. You could hear it a long ways too. Everywhere. But now you don't see any. I don't know where they went.

"One time everybody from here went down to Koyukuk. Big potlatch down there. Dances, things like that. But we went out the other side of Big Hill. We had a tent. We check our traps. Pretty soon we came back and they said, "There's caribou." So we went back up and followed the ridge down to where the Keta cuts from the other side, and we sneaked down. And right there laying down there were six caribou. Bang! one dropped. Bang! another dropped. We shot six of them. We cleaned them all and made a trail to haul meat. That time when we come out everybody was coming back from Koyukuk. Big potlatch, dancing, everything. We was out there; we was just hunting that's all. We didn't go to Koyukuk that time.

"Sometimes 12, 15 teams go out together to hunt caribou. One time we see about two, three hundred caribou. One time I was hunting behind Kokrines and I seen an all white reindeer. I tried to get him but I couldn't. He went over the ridge. I got tired and I started to eat snow and doggone, I couldn't do nothing. Finally I got to my sack. I had some candy and things in there. I eat a little bit and started walking. Before that I could just barely make it. So if you get tired never eat snow. When you eat snow pretty soon you get worse.

"We used to have lots of beaver here but they're almost gone. We would take just two big ones. Them guys now, the way they trap, they just take them all. They go by snow machine and take'em all, little ones and all.

We used to catch two big ones and pull our snares. Close to the beaver house you catch little ones, let it out farther, you catch big ones. Now they just leave them there till they catch them all. We use snares; they are better, of course. Traps they spring and you can't catch them. They won't go near them no more. But snares, even if they pull it, they don't know till they get caught.

"In the old days there used to be lots of wolverine, lynx and fox. One time I shot a black fox up here in the slough. I was coming back from Nulato. It was snowing. I see fresh fox tracks going up this way. I look up there, it's snowing and I see way up there. Take out my .30/40 long barrel. I lean way over. Bang! I hit right there. Then I put the gun on the sled and I say, "Haw!" And them dogs run up there and I pick it up. I sold it for $125 cash down in Nulato. That was a lot of money then.

Now you buy $30 or $40 of something, you put it all in a little sack and pack it out. Long time ago, $30 or $40, you need a big sleigh to carry it and you still have some more money in your pocket."

Henry James "Harry" Pitka

"I was born in a spruce-bow tent at the mouth of the Nowitna River (in 1898) My folks were out hunting. In the olden days you had to go out to get something to eat.
"I had a tough life. My mother got drowned. My dad was murdered. He was a pilot on a riverboat. One day he quit the boat and they took a gun and shot him. That's the way it was in the old days. No law. People done as they pleased. Mom was about 60 when she got drowned. She was at a fish camp with a couple of my sisters. I was packing mail at he time, but I came in to fish. It happened in the spring on a side creek. She was out by herself and fell in. She couldn't get out. My mom didn't raise me. She gave me to a medicine man. Old Peter. He lived at Moose Point, seven miles above Kokrines. That's where I was raised, mostly. I had more than 12 sisters but they died young, mostly. I have only one sister left. There were about 30 or 40 people at Moose Point. There was a store there, had two stores at one time. Then all the people moved away. I was 19 when I went on my own. I done everything.

"I got married when I was pretty young, 20 or 21. Laura was her name, Laura George. Her dad was from Kokrines. He died of TB, too. There was no cure for it in them days, and it nearly killed my wife.

I done everything: trapping, fishing, hunting, run mail, did some carpentry work. Got plenty good at it. I started packing mail when I was 20. I'd just got married and needed the job. I was off the mail for a while when trapping was pretty good. Two years, I think, then I got back on. I worked for Henry Robson who had the mail contract. He just took a liking to me and it was pretty handy. He wanted me to work for him all the time. All that was a long time ago.

"I ran in both of them serum races. The first one was pretty cold, but cold weather didn't bother me. Your dogs is all right in cold weather: they're built for that. But you got to watch the overflow. My normal run was from Tanana to Ruby and back. one-hundred-twenty miles one way. In those days you had to go every day, rain or snow or a hundred below. Not like these days. Now you wait for the weather. I ran three teams, 20 to 25 dogs a team. The contract called for three trips a month for six months. The same dogs would work all winter. Usually I ran with 17 dogs. The others were spares. It depended on the load. We had to make 30 miles a day for four days. Laid off one day in Ruby and one day in Tanana. That's all the rest we had. I did that pretty close to 10-12 years. I got pretty good with dogs. We made good money. Five dollars a day plus room and board. For a while I got $6 a day because I was good with dogs and they could trust me. I ran mail until the airplanes took over in 29.'

"I ran that serum twice. The first time I took it from Edgar Kalland and gave it to Billy McCarty. The second time I took it from Sam Joseph and gave it to a white guy. His name was Eddie Farrow. He had some bird dogs with him. Outside dogs. They didn't make good time. He is still living, I think in the Pioneers' Home in Fairbanks. On one of them races I left Kokrines about half-past ten.

There was the moonlight to see by. I got to Ruby at about one o'clock. It took me three and a half hours. Good trail, nice moonlight. Only had about 20 pounds to haul. The books got it wrong about that serum run. Solomon Besco, he took it out of Tanana to Kallands, 33 miles down the road. That was the first run. That's all he ran. They don't have his name in the book but it's true. You can ask the old people around Tanana. Of course there aren't many old people around there any more.

"I went to school here and there. The people who raised me were mostly hunting all the time. I only went to the fourth grade. Went to a Catholic Mission school in Kokrines off and on. Father Jette baptized me. I used to be an alter boy for him. I loved that guy. I liked those hotcakes he made. You didn't get much of those in them days. Not punks like us.

"I trapped different country every year. Wherever the best fur was. In 1927 me and another fellow brought in over 100 lynx. Fur was high in them days. Fred Olin was my partner. He was about a year younger than I was, but he was a good man, a born trapper. I worked as a deckhand on the big sternwheelers, too. I was on the "Sarah" the "G.P. Light." They were all alike, wood burners. Used to chop four-foot wood for the boats. Always a way to make money in them days. When you weren't trapping, you cut wood."

Edgar Kalland

"My dad was from St. Johns, Newfoundland. He was just wandering around. Fishing and sailing. He sailed around the Horn to Saint Michael. Then he worked his way upriver by steamboat. My mother was born and raised around Nulato. They settled in Kallands, running a roadhouse and cutting firewood for the steamboats. At that time there were people cutting wood every 20 miles up and down the river. Starting dog mushing was just natural. I worked on the boats in the summer and in the winter I had to get some kind of work. I couldn't just lie around. I lived in Tanana until 1935. Moved to Kaltag in the fall of 1935. Been working all my life. I never laid up no time.
"During the serum run I just over 20.

Time stands still at that time, the prime of life. It was just an everyday occurrence as far as we were concerned. I was working for the Northern Commercial Company as an extra driver. I didn't have my own dogs but used the company's. Johnny Palmer told me to take the mail up to Nenana for the NC people. The horse teams were tied up. They couldn't take them out in -50 degrees. It froze their lungs. I got into Minto and got a phone call from T.A. Parsons. He told me he wanted me to go back to Tolovana. I had to backtrack 20 miles so I could pick up the serum from Bill Shannons at about 1:30 pm. Bill Shannons was the NC manager in Nenana. I took it from Bill at Tolovana to Manley Hot Springs.
"I married in 1928, November 7. We had our 50th anniversary in November. I worked on the boats till I got an engineer's license and that was a big deal. I worked Saint Michael to Marshall 25 years, 1947 to 1963.
"I've been in the hospital three times. They told me, "Take your time. Slow down." I'm no more slowed down than I ever was. I try not to let things get me down."

Charlie Evans

"I was born about 18 miles down there by Bishop Mountain (in 1903). My dad was cutting wood for the steamboat. There's a village at the mouth of the Koyukuk now, but there wasn't before that time. People used to come over and visit all the time. And people camped around there in the summer. It was a good fish camp. But they stayed different places in the winter. They didn't start that village until about 1903. My dad put up a store there then.

"My dad was John W. Evans. He was from Malad, Idaho. Ten of them bought a share in a sailing schooner. He was about 19 and he was breaking horses in Idaho. He bought a tenth share in that schooner. On the way up they had a lot of trouble with their captain so they fired him and got another. They came up the Yukon River. They got stuck on one side, then the other side. They finally hired a Native from down there and he took them all up the river. It took them all summer and they got froze in at the mouth of the Koyukuk.
"My grandfather on my mother's side was a chief of a family that lived at the mouth of the Koyukuk.

My mother died there in 1908 and my dad was pretty hard stuck, taking care of the store and taking care of us, too. There were three boys in the family. My dad took us down to Holy Cross in 1908. We went down in a rowboat from Nulato to Holy Cross. There was him and another fellow named Dahlquist who had a roadhouse at Nulato that time. My dad was on the way out that time. I went to the Mission School there at Holy Cross.

I stayed there for eight years. I went to fifth grade. I learned the Latin prayers. Learned some French from the French-Canadian Sister.

"Holy Cross was a starvation proposition. There was nothing to eat. Kids had to go out to shoot rabbits and ptarmigan with bows and arrows. Our Sunday dinner was beans - white beans. Our Christmas dinner was a slice of corned beef and canned potatoes. It was a treat. The nuns were French-Canadian: the priests were Italian Jesuits. At supper we had a piece of dried fish.

"We stayed there every summer except 1912. I remember that really well. That was the year the volcano blew up by Mount Iliamna. Never saw the sun all summer. One time in 1916 we were home and my dad was going to send us back to Holy Cross. The last boat was coming. We went out into the woods and we stayed there all day. The steamboat stopped there at Koyukuk to pick us up but no one was there. They thought we'd come in and get on the boat but we weren't going to go back, that's all. In the afternoon the steamer took off so we stayed home that winter.

"In 1917 we went down to the States. We went to Cushman School for three years in Chemawa, Oregon. There's a big school there now. I think the kids are Navaho and Alaskan. I didn't want to stay there too long so I skipped two grades. I was Outside there during the First World War. We were in Tacoma one time. We stayed up until six o'clock in the morning and watched the train going back and forth out in the yard. They thought we were crazy, but we'd never seen trains before. I was Outside for five years, then I came back to Koyukuk in 1922.

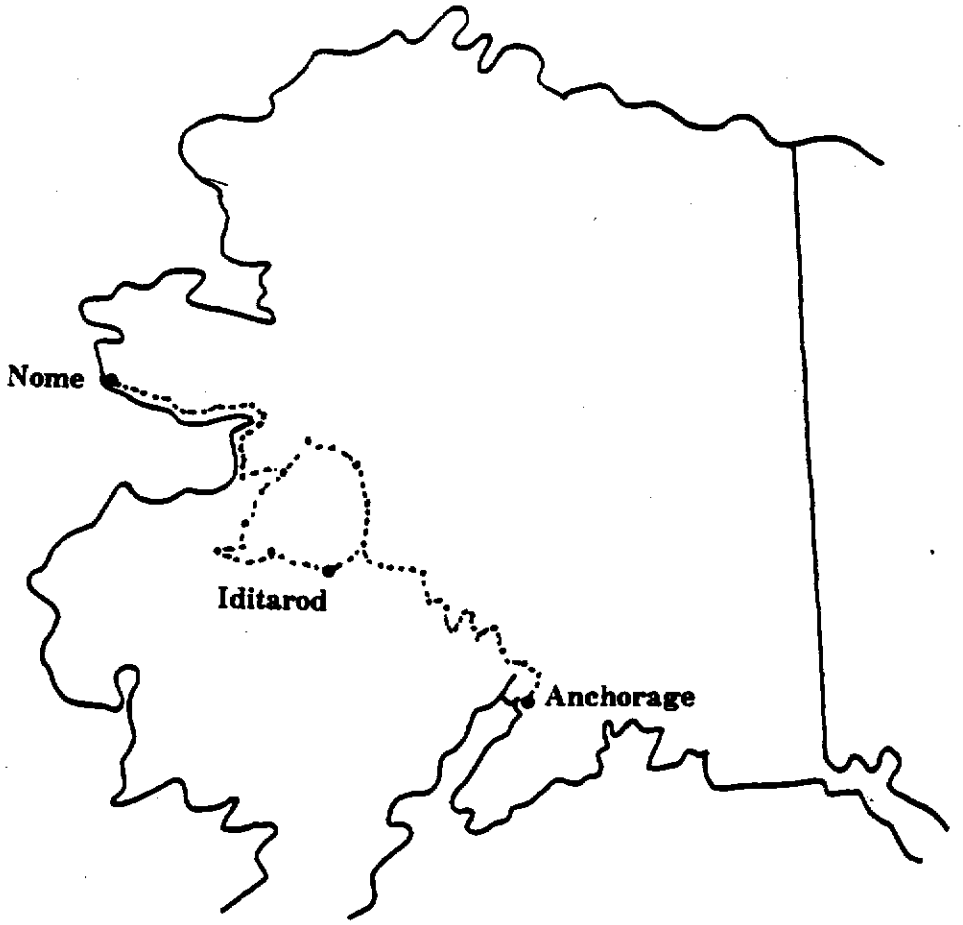
"When I got back to Alaska my dad had a boat freighting on the Koyukuk. I worked on that. It had 28 horsepower with 35-50 tons to haul up the Koyukuk. We went as far as Alatna. We had to land and haul the scow upriver. Put some men out on a rope and they'd pull against the ripple. We'd pass the ripple and they'd get back into the boat and we'd pick up a crew and go on up to the next camp. They'd leave their canoes on the barge; when they got tired of pulling they'd put their canoes back in and float home. Good wages in them days: $3 a day and board. There were a lot of ducks and bear and things along the way. We didn't haul downriver; steamers did that. For a while, the steamers went up the Koyukuk but quit about 1916. There wasn't enough freight....

"In 1925 I was running a store at Dulbi for my dad on the Koyukuk River.....I had to make a trip down to Galena to bring furs for my dad that I picked up in Dulbi. That's when they called for drivers for that serum run. I got to Koyukuk that day. I went to Bishop Mountain to wait for the serum to come in. They couldn't get drivers. Some of the fellows wanted to know if they were going to get paid. I told them I'd go there. They didn't have to pay me for that. My dad told me he was the one in charge of getting the drivers. I had two dogs that died on me that time. Froze. Bird dogs. Outside dogs. It was down by Koyukuk. The harnesses constricted their legs; they turned blue and swelled up.....It was 62 below....It was a good trail from Koyukuk. There was a little breeze blowing, a light sandy drift, hard pulling.

"In 1925 I was on the first serum run, but on the second one I was up the Koyukuk. I just did it; I never thought about pay.

When I came out of the Koyukuk River that summer there was a $36 check waiting down there. A couple of days later there was $18 from ladies organizations Outside who had heard about it. They paid 50 cents a mile."

Iditarod Trail



Race Route

EXTENSION ACTIVITY 4 — 2.14

Alaska's Future in Transportation

It is the year 2025. Describe and draw one form of transportation in Alaska for land, water, air or any combination of the three. The system must take into account terrain, weather, distances, tourists, cost, etc.

EXTENSION ACTIVITY 5 — 2.14

President Warren G. Harding

It is July 15, 1923. Present Warren G. Harding is going to drive the golden spike signifying completion of the railroad at Nenana. You are there. Your family lives in Seattle, and in your weekly letter to them describe the day's events, Harding's dedication, the town, the people, and your thoughts about Alaska and its new railroad. (At least two pages)

EXTENSION ACTIVITY 6 — 2.14

Women in Aviation

Write a newspaper article detailing Ginny Hill Wood and Celia Hunter's flight to Fairbanks in 1946. Remember, use who, what, when, where, why, and how information and be factual.

EXTENSION ACTIVITY 7 — 2.14

Personal Opinion

The Governor has appointed you to a task force to explore the pros and cons of subsidized public transportation. The task force has been compiling information and researching each side. A meeting is scheduled for each member of the task force to give his or her opinion on the question, "Should government subsidize transportation systems in Alaska?" Decide what your opinion will be and prepare for the meeting. Provide a copy of the secretary's transcript. A transcript means there isn't any narration. The writer records only the words of the speaker.

EXTENSION ACTIVITY 8 — 2.14

US! Hovercrafts - ATVs - Kayaks

MATERIALS:

VCR

Videotapes: US! Program 14 -- Hovercrafts
ATV Safety: The Goal
Qayaq: Kayaks of Alaska and Siberia

AFTER THE PROGRAMS:

1. Do you believe an air-cushioned vehicle should be categorized as a car? a plane? a boat? Does this type of transportation present any problems to the environment? Should licenses be required?

2. List three uses you may have for a hovercraft in your community.

3. What are three major problems associated with the use of three-wheelers in Alaska's rural communities? How can these problems be eliminated?

4. Compare the traditional Eskimo kayak design with that of kayaks today; how are the two different? How are they similar?

5. List all the transportation systems in your community, and the pros and cons of having such systems in your town. Design one futuristic transportation system which could be used in your town and describe how it will work; please consider environmental impact in your design.

ALASKA TRIVIA 2.14

Alaska has the greatest number of pilots and light aircraft in he United States. Six times as many pilots per capita and twelve times as many airplanes per capita as compared to the rest of the United States.

1. What air carrier logged 87 flights in the Berlin Airlift?

2. What transportation was used by Alaska's first drive-thru bank depositor, Milton Skaats?

3. What cities are connected by the White Pass and Yukon Railroad?

Unit 2, Lesson 15 Can You Hear Me?

Here is Lesson 15, which discusses communications as a resource for Alaska's people.

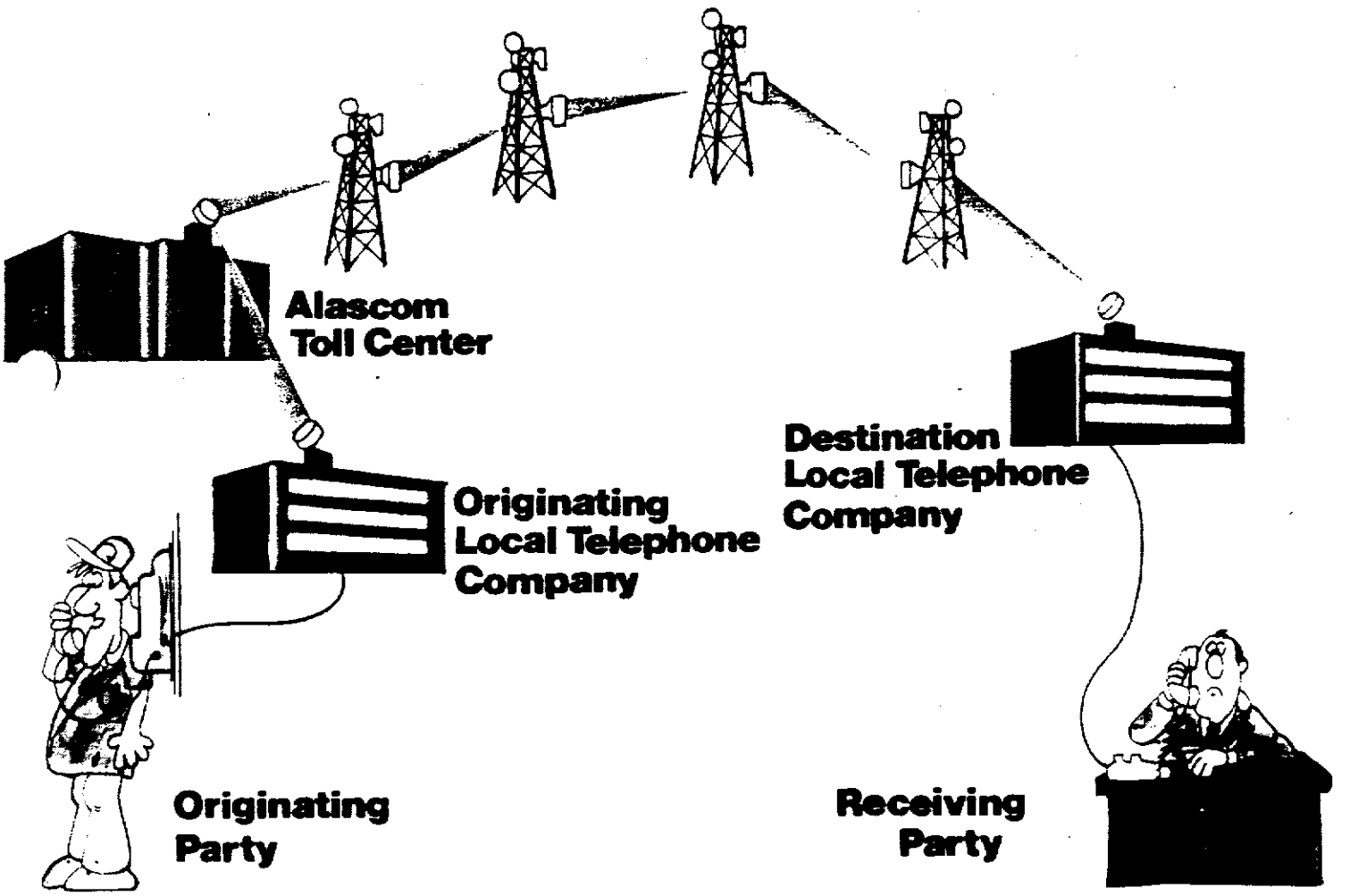
It will take you 4 class periods to complete the minimum requirements.

Coming up: Look through the activities for Lesson 19 to see if you need to order supplies or materials.

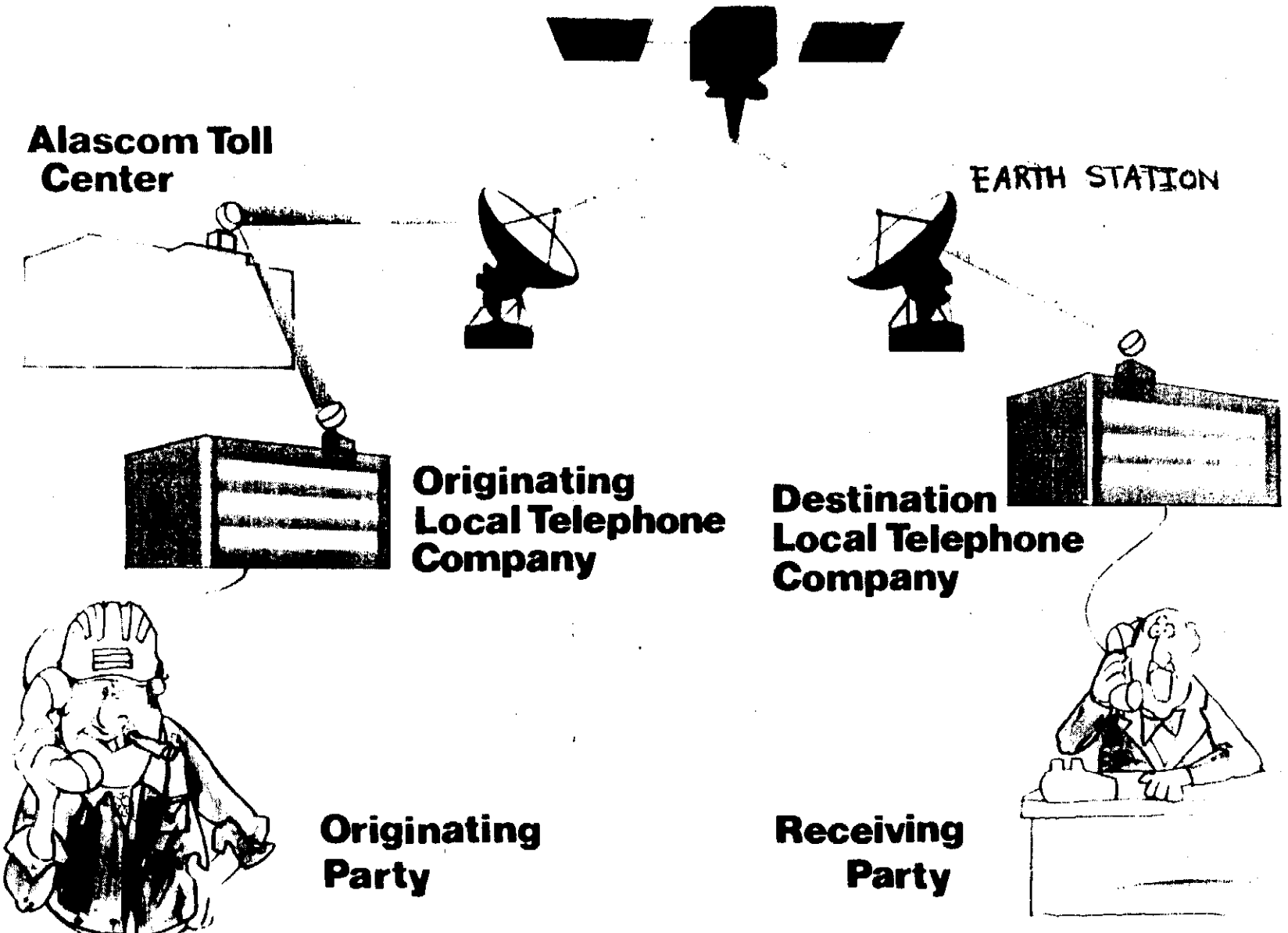
Warm-up: Complete this first.	☐ Telephone Communication, p. 361
Information: Complete this next.	☐ Can You Hear Me? pp. 364-69
Extension Activities: Complete two activities of your choice.	☐ 1. Communications Research, p. 370* ☐ 2. Communications and Me, p. 371* ☐ 3. Extended Reading*:"Government Subsidy to ☐ Industry," J. Hacker; "Alaskan Settler," J. McPhee ☐ 4. Communications Activity, computer, p. 372* ☐ 5. Telecommunications, video, p. 373* * May be sent via e-mail if student has access.
Sourdough Lingo*: Complete this as you study the lesson.	☐ telecommunications satellite White Alice ACS geosynchronous
Alaska Trivia*: Optional	☐ Communicating Trivia, p. 375
Assessment:	☐ See page 377 for instructions on Assessment 5 and your Mid-Term Exam.

When you make a local call, the call travels over wires or by radio to a central office. There, automatic switching equipment connects your call to the phone you are calling.

The three digit prefix specifies the geographic area of the call and the last four digits specifies the exact location of the person being called.



Telecommunications via Microwave



Telecommunications via Satellite

OBJECTIVES 2.15

Can You Hear Me?

Here's what you will be studying in Lesson 15. Upon completion, you should be able to answer these questions.

What is Alaska's communication system like today?

How do we receive satellite communications?

What are some of the uses of communications in Alaska?

How has modern technology affected Native villages?

How do communications affect your community socially and economically?

How do subsidies affect communication in Alaska?

How does geography influence communications and its cost?

What is one future communications alternative?

Can You Hear Me?

Not long ago many remote villages in Alaska had no telephone service and no television. As recently as the 1970's, television news and sports programming to Alaska were a week to several weeks behind the actual airing in the Lower 48. You could watch last week's news, last week's football game, and last month's world championship fight. When you asked someone why they moved to Alaska, the joke was, "Because I liked last month's news so well."

The rapid and dramatic improvements in electronic communications in the 1970's was due largely to **satellites.** The government was willing to support and encourage this improvement because it believed a modern communication system was essential to economic development. Large businesses need to know what is going on elsewhere. They need the most up-to-date information from Washington, D.C., and Wall Street, for example, upon which to base their business decisions.

Although satellite communication is remarkable and dramatic, no overview of communications in Alaska would be complete without a word about the newspapers, magazines, and journals that have kept Alaskans informed long before electronic communications came of age.

Alaska is also served by dozens of local radio and television stations. Since the 1940's and continuing today, radio stations have provided important one-way communications with people in the Bush.

Bush message shows like "Tundra Topics" and "Caribou Clatter" have notified Bush residents of the arrival of friends, supply plane schedules, and family announcements.

WHAT IS ALASKA'S COMMUNICATION SYSTEM LIKE TODAY?

In July, 1969, Alaskans experienced something new and amazing. In the first live satellite program to the state, Alaskans watched Neil Armstrong walk on the moon. However, the expense of using the satellite prevented all but a smattering of sports events from being broadcast live for the next several years. But Alaskans had tasted live TV, and they liked it.

Watching live TV from the moon was certainly a long way from the isolation Alaska had suffered through for so many years. Until 1900, a single telegraph line from Whitehorse to Skagway was the territory's only link to the Outside. That year, Congress authorized a cable from Alaska to Washington, D.C., called the Washington/Alaska Military Cable. It was renamed the Alaska Communications System (**ACS**) in 1935.

During World War II, ACS was expanded. Open wire facilities were built along the ALCAN highway through Canada to Fairbanks and Anchorage, providing Alaska with its first military and commercial telephone service over land lines. ACS also installed and operated radio links throughout Alaska, and operated toll telephone switchboards that linked the local telephones of Alaska's cities and provided telephone links with the Outside. These were tremendous improvements.

Even after World War II, the military played a large role in developing Alaska's communication system because of the state's strategic location at the top of the world and bordering the Soviet Union.

In the early 1950's, the **White Alice** Communication System (WACS) was developed to provide military communications between the scattered military aircraft control and warning sites and airfields.

Built in 1952, White Alice Communications System looked like a series of giant drive-in movie screens, stretching from the Aleutians to the shores of the Arctic Ocean. Using tremendous amounts of power, White Alice transmitters bounced signals off the trophoshpere to other receiving stations.

Like the ACS, White Alice carried limited commercial traffic, that is, non-military business or personal calls.

ACS meanwhile, was evolving into a commercial communication system. When the Army first established communication (ACS) in 1901, 38 percent of its calls were commercial. By 1971, 95 percent of its calls were non-military.

This increase in commercial traffic and the demand for greater service (any commercial call could be "bumped" for a military call, for example) prompted Congress to authorize the sale of ACS in 1967. By January, 1971, RCA Alascom had taken over the ACS, marking the beginning of the first modern, state-wide, commercial communication system in Alaska.

In December, 1973, RCA Alascom began regular satellite operations in the U.S. using the Anik 1 satellite. Two years later, RCA Alascom launched its own communications satellites, SATCOM I and II. These satellites carried television programming and handled more than 50,000 long distance telephone calls a day. These satellites are still in operation today.

Now, about six to eight hours of network programming is beamed to the state from California and the East Coast daily. Most of this is news, specials, and sports. Even these satellite transmissions, however, are usually presented to Alaskans on a time-delay. If not, the evening news would be shown at 3 p.m. when most people would be unable to watch it.

Communications is a rapidly changing field, because the technology is growing and changing every day. The history of communications shows that Alaska has been in the vanguard of those using communication innovations. Some of the ways Alaskans communicate today are:

Telephone: Today a majority of Alaskans have access to telephone communications, and many have phones in their homes.

VHF (Radiotelephone): Others regularly rely on VHF radio communication as their communications systems.

Citizens Band: Use of the CB in villages is common. Often a single channel is monitored, and residents use this not only as a personal communications system, but for public announcements as well.

Computer Networks: Electronic mail systems, which utilize computers and telephone lines, are becoming common in Alaska, both in the public and private sector. Individuals with computers often subscribe to information networks that reach throughout the country.

Television: TV is available to most areas in Alaska, either by cable or by satellite. In addition, satellite dishes are becoming inexpensive enough that individuals can now have their own dish and pick up any frequency delivered from the satellite to which their dish points.

The State of Alaska continues to underwrite a news and entertainment television channel known as Rural Alaska Television Network (Ratnet), which is controlled by a Board of Directors.

Radio: With over 45 million radio receivers throughout Alaska, many areas still receive one-way communication through this medium. Programs like "Caribou Clatter" collect messages to

those in the bush, then broadcast these personal messages at certain times of the day. For families without telephone, CB, or VHF radio, these message programs can be a vital communications link.

Printed communication: Letters, newspapers, magazines, and books are very important in Alaska's communication efforts. With the increase in frequency of mail delivery, both by ground or air, it is easier to receive printed material as well.

WHAT ARE SOME USES OF COMMUNICATIONS IN ALASKA?

Since the early 1940's, the main source of medical care in remote villages has been health aides, who maintained contact with hospitals via short wave radio.

With the advent of satellite communications, most villages with telephone service had a second line reserved for the Native Health Service. The special telephone allows health aides to exchange information and diagnoses with doctors at regional hospitals.

Oil movement for the 800-mile Prudhoe Bay pipeline is controlled by a control center at the Valdez terminal that is linked to sophisticated microwave remote monitoring equipment.

The University of Alaska has a computer network that links computers throughout the state. Students, university branches, school districts, and university employees can send and receive messages files or use bulletin boards on the system.

Another form of communication very important to Alaska's fishermen is Loran C. Built to assist with long range navigation, these Coast Guard-manned shore stations transmit signals that are received by vessels in the Gulf of Alaska. Interpretation of the signals specifies the exact latitude and longitude of the boat.

Automatic teller machines have become very popular in recent years. Did you every wonder what makes them work? Every machine is a computer of sorts, and is networked to all other bank branches and ATM machines throughout the state. Transactions at any one place are instantly recorded in your account. These are just a few of the ways what telecommunications are used within he State of Alaska. Can you list more ways?

HOW HAS MODERN TECHNOLOGY AFFECTED NATIVE VILLAGES?

Modern technology has affected Native Alaskans in many ways. On the one hand it has made life easier by providing better tools, better medical care, better education, and more opportunities for young people. On the other hand, many Natives feel the strong bonds of the traditional village pulling apart under the influence of new technologies.

In December, 1976, the State of Alaska and Alascom announced on agreement to provide television transmission via satellite to 23 rural villages. Most of these villages began receiving television for the first time early in 1977.

How have modern communications affected Native villages? Several studies of TV's effect on Eskimo and northern Indian communities in Alaska and Canada have produced mixed findings. Changes in village life may include a drop in children's interest in traditional activities such as camping and hunting and a decrease in visiting between village residents. Some studies show a drop in attendance at social meetings, children's story hours, and other community functions.

On the positive side, studies report an increased sense of time and greater punctuality, indications of a reduction in alcohol use, and a positive effect on language skills.

Anyone who has ever seen a child (or an adult for that matter) stare with total concentration at the "boob tube," oblivious to everything else, has some idea of the power of television. Although there is no consensus yet on what effect television has had on Native villages, most people agree that television does shape the values, ideas, and self-concepts of those who watch it regularly. What do you think will be the effect of television on Native village life?

HOW DO COMMUNICATIONS AFFECT YOUR COMMUNITY SOCIALLY AND ECONOMICALLY?

The ability to communicate with others in your locality and your state is a vital community resource. Through communications, you can learn about events and happenings, job opportunities, retail sales, health and welfare of others, and current events.

You can give an opinion to your legislator, order goods from a catalog, and keep in touch with your family. It is because communication is so important that the State of Alaska has gone to great extremes to see that it is available.

Think about the kinds of communication available to you in your community. How many methods do you use? For what do you use them? How do they affect you, socially and economically? You'll probably agree that communications is a very important resource.

HOW DO SUBSIDIES AFFECT COMMUNICATION IN ALASKA?

A subsidy is a grant of money from the government to a private enterprise considered to be of public benefit. Since communication in our vast state is so important, the state government subsidized our satellite communication system, which provided telephone and television to remote communities.

One of the big events of any small village is the arrival of the mail plane. Nearly everyone turns out to greet this welcome visitor, and hopefully to receive freight, letters, newspapers, produce, and other goods. In many communities, the mailplane would not be possible without a subsidy from the federal government, because the communities wouldn't generate sufficient traffic on their own to be profitable. Subsidies were common early in aviation history but are gradually being phased out as part of airline deregulation, begun in 1987.

Isolated communities that have a reasonable need for service now fall under a program called Essential Air Service, which has been enacted in place of actual subsidies.

Yakutat is one of these communities. Because there are no roads to Yakutat, no state ferry service, and barge service only a few times a year, residents of Yakutat receive not only mail and produce, but freight, like lumber and building supplies and appliances, by air. Imagine trying to unload a washing machine from the airplane!

HOW DOES GEOGRAPHY INFLUENCE COMMUNICATIONS AND ITS COST?

Just as with everything else in Alaska, geography plays a large part in the kinds of communication systems that have been developed. Where long lines form a large part of the communications hardware in other parts of the country, Alaskans have vast distances, mountain ranges, glaciers, impassable rivers, and other barriers to long lines.

A great deal more reliance has been placed on satellite systems, or other systems that use the atmosphere or space above the earth for sending signals. Microwave relay stations are a common sight on the mountains near many communities.

Alaskans have had to use more costly methods of communication and consequently pay more for this service than people in the Lower 48.

WHAT IS ONE FUTURE COMMUNICATIONS ALTERNATIVE?

The future holds even greater emphasis on electronic **telecommunications.** (Telecommunications means communicating at a distance.) Two-way audioconferencing is already a reality, and two-way videoconferencing is becoming less costly than in the past. More and more people will tie their home computers to huge data banks in the Lower 48 through long distance subscription lines.

The state has recently consolidated data circuits among Anchorage and Fairbanks and Juneau, providing more efficient and economic data transmissions. Advancing technology makes many more kinds of communication possible, especially as more people become aware of the equipment's potential. Using sophisticated electronics to move, talk, convey, or manage affairs from a distance is much more cost effective than actually traveling to that spot.

HOW DO WE RECEIVE SATELLITE COMMUNICATIONS?

As recently as the 1950's, placing a telephone call to the outside could be frustrating. In Anchorage, for example, you first had to wait in line at the old Federal Building where an ACS employee would write down the number you wished to call and pass it on to an operator at a nearby toll center. When the operator was ready to make the connection, you would shuffle into one of four booths and pick up the phone. After the call, the ACS employee would collect the charges as you left the booth.

Things are quite a bit easier today; all you need is the ability to pick up a receiver and dial 11 numbers.

But behind that apparent ease is a complex system of satellites and earth stations that carries your voice on a long and circuitous route to the edge of space and back. There are major and mid-route satellite earth stations, small earth stations, toll centers, microwave links, up-links, and down-links. From a remote village to a destination 5,000 miles away in the Lower 48, your call may have to travel 90,000 miles!

At the village, the call is sent by a small earth station (a transmitting and receiving dish about 5 meters across) to a satellite in **geosynchronous** orbit some 22,000 miles in space. (Geosynchronous orbit means that the satellite remains in a fixed location in relation to the Earth; it orbits as the Earth rotates and remains above the same spot on Earth.) The signal is boosted by the satellite and beamed back to a major earth station near Fairbanks, Juneau, or Anchorage.

From there it is sent by microwave to one of three toll centers where the call is processed. The call is beamed by microwave to a gateway satellite station and up-linked 22,000 miles to the satellite, which down-links the signal to a receiving station in the Lower 48. From there the call enters the national network of long lines. Even though all of this occurs at the speed of light, callers may sometimes notice transmission delays and echoes in the system. Read more about satellite communication in the section "Telecommunications" in your Alaska Almanac.

COMMUNICATIONS TIES ALASKANS TOGETHER

In order to effectively manage the affairs of our state and its natural resources, communication is very important. Alaskans have used many varied forms of communicating throughout the years, and remain in the forefront of the communications field, using ever more sophisticated means to tie the state together.

TO DO:

Follow the instructions from the introduction on preparing your journals for this course. 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:

Communications Research Project

Choose one of the following projects.

1. Satellite communications are a very important part of Alaska's total communications systems. Investigate the satellites that service Alaska and the communication systems they provide for the State of Alaska and its residents.

2. Investigate further the mechanisms for receiving satellite communications. Alascom would be a good resource to contact. If you can, visit an earth station where someone can describe how satellite communications work. Make diagrams or models of the primary pieces of equipment used.

3. Research one telecommunications network that is being used in the state of Alaska. Describe how it is set up, and how it works. (i.e. AlaskaNet, UCAN)

4. Investigate the differences in communications in your community between the present and 50 years ago. Make a poster that has two parts: one for illustrating communications 50 years ago, and one that shows communications today.

5. Interview at least one person who works in the field of telecommunications. Find out what that person's job is, how the performance of it affects that form of communication, and how this branch of telecommunications works. Ask that person how telecommunications may change in the near future. Use audiotape or videotape for your report.

6. Research one communication advance in Alaska's history, then tell how it influenced the state. Good ideas for subjects are: White Alice, start of airmail delivery, WAMCATS, VHF mobile telephones, the first public radio or television station, the first live satellite broadcast, and submarine cables.

7. Investigate one future telecommunications alternative that you feel may be used within the state of Alaska. Tell about how it will work and how Alaskans will use it, either in person, on audiotape, or on videotape.

EXTENSION ACTIVITY 2 2.15

Communications & Me

Communication is defined as giving or exchanging information. Consider the various forms of communication in your life everyday: radio, telephone, TV, letters, magazines. Can you think of more? Write a list of all the forms of communication in your life, and in your community.

Prioritize them. Decide which service you feel is most important to you. Tell why you feel that form of communications is important. Describe what you feel your life would be like without it. Include your feelings about this statement, "Improvements in communication have helped to bring about a shrinking world." Do consider any negative effects a communication technology may have had.

EXTENSION ACTIVITY 4 2.15

Communications Activity

MATERIALS:

Computer
Modem
Communications Software
Telephone Line

TO DO:

BEFORE:

If you have not used the electronic mail portion of this course, this will be a new activity for you. If you have used electronic mail, this activity will allow you to learn more about the practical uses of telecommunications.

Before you can send a message on electronic mail, you need to know the basic procedure of logging on the system. Read the electronic communications documentation provided at your location with this course. You will need to know how to use the communications program with the computer you are using. And you will need to know how to log on and use either the University of Alaska Computer Network or AlaskaNet. If practical, ask your supervisor to demonstrate the logon procedure and use of electronic mail.

DURING:

Once that you have familiarized yourself with the communications software and electronic mail service that you have access to, do one or more of the following that you have not done before:

1. Send and electronic mail message to your distance delivery instructor. Include the following information:

   Name
   Date
   Location
   Any questions you may have about Alaska Studies

2. Send a message to an Alaska Studies student at another location around the state. Check the mailbox for a reply after a day or two.

3. Learn how to send (upload) a data file through electronic mail. Send an assignment to your distance delivery instructor. Check the mailbox for a reply within 48 hours.

4. Learn how to download an electronic mail message. Download means to capture a file to memory. Not all communications programs can do this. However, most have this capability. Create a file and download an incoming message into the file. This is very convenient as you are not printing the message into the file immediately, but rather storing it. You can print it out later at your convenience.

EXTENSION ACTIVITY 5 2.15

Telecommunications on the Last Frontier

View the videotape "Telecommunications on the Last Frontier" Part II. Or read the following summary.

Do the Pre-Program Activities and then choose one from the Post-Program Activities.

Pre-Program Activities

1. Vocabulary Match: Fill in the blanks with the corresponding letter.

   A. geostationary

   B. amplifier

   C. solid state

   D. transponder

   E. array

   F. communications satellite

   G. telecommunications

   ___ A device which enables an input signal to control a source of power. As a result it is capable of delivering at its output an enlarged reproduction of the signal.

   ___ A man-made object that revolves around the earth, designed to reflect or relay signals used for communications

   ___ A combined receiver and transmitter

   ___ An orderly grouping

   ___ The prefix means at, over, a distance. The root means to impart, transmit, give, or exchange information.

   ___ The prefix mean of the earth. The root means fixed, unchanging.

   ___ An electronics term used to described components equipped with transistors. Transistors replaced vacuum tubes.

2. Make a list of the communication services in your community. If possible talk to representatives of these service organizations to learn when the communication service was installed in your area.

Summary

This is a technical presentation of how Alaska's modern telecommunications system works. It features AURORA, Alaska's own communications satellite, and the communications network that joins virtually every village and town in Alaska.

The remote Russian Village is an example of how Alaska's telecommunications systems reaches out into the state. It points out that a telephone can change village life for the better and how the system that makes the telephone possible also accommodates television reception.

Alaska's first satellite, SATCOM, was launched by a Delta rocket, then boosted into geostationary orbit about the earth. The satellite was the first to use solid state amplifiers, which increase power and improve signal quality, in all its transponders. It also has an on-board computer to hold the vehicle in perfect position, and an advanced solar cell array to capture more power from the sun.

Alaska's earth stations had to be repositioned to receive signals from AURORA, which was located at a different position in the sky from the previous SATCOM. Since some of them were "locked" into position by weather and inactivity this wasn't easy.

POST-PROGRAM ACTIVITIES

1. A satellite such as AURORA remains stationary at a point over the earth, even though it is traveling at 6,876 miles per hour and is 22,300 miles above the earth. What factors might cause AURORA to lose its effectiveness in space?

2. If possible interview individuals in your community who are associated with telecommunications. Find out what communications were like 15 years ago, 30 years ago. Put together a ten-minute radio script about telecommunication in your town or home and what benefits it provides; if you have a tape recorder, produce your radio program if possible.

ALASKA TRIVIA 2.15

1. What eight foot ground to air signal means "unable to proceed?"
2. What was Alaska's first statewide Native newspaper?
3. Who starred in the 1925 silent movie comedy "The Gold Rush?"
4. What poem did Robert Service call the keystone of his success?
5. What do the call letters of radio station KFQD stand for, according to the station?
6. What was Alaska's first commercial radio station?
7. Who is the "Bard of Alaska?"
8. What first was the big news Roald Amundsen telegraphed from Eagle to the world?
9. What prolific author wrote the novel Sitka?
10. What Native art is Nathan Jackson known for?

ASSESSMENT 5 (Lessons 14 - 15) 2.15

You have completed Lessons 14-15. 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 5 in his or her test packet. Your home teacher must monitor you while you are completing Assessment 5.

MID-TERM EXAM 2.15

You are required at this time to complete the Mid-Term Exam which encompasses Lessons 1-15. Go back and review the objectives for each lesson. Your home teacher has the exam in his/her test packet and must monitor you while you are completing the exam. You should complete the exam in 2 hours.