Alaska: Spirit of the Wild, an IMAX® film, produced by Graphic Films Corporation for Alaska Partners, Ltd. in collaboration with

Houston Museum of Natural Science
Alaska: Spirit of Wild transports viewers on an IMAX® voyage into the last great frontier where nature enchants the eye with magnificent spectacles. Viewers will find themselves fishing with brown bears, soaring with bald eagles, dodging calving glaciers, and racing on the hooves of the caribou—all from the comfort of a theatre seat.
This film masterfully relates the genesis of Alaska and then explores its rich history, surprising wildlife, magnificent landscapes, harsh climate, and abiding spirit.

Alaska: Spirit of the Wild, an IMAX®/OMNIMAX® film,
Produced by Graphic Films Corporation for Alaska Film Partners, Ltd.
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INSERT: Glacier Game and Cards

INSERT: Ice Age Animal Cards

HOW TO USE THIS BOOK:
This booklet is designed to supplement the film Alaska: Spirit of the Wild, but can also stand alone as a valuable teaching tool for students of all ages. The material was designed primarily for 4th through 9th grades, but can be easily adapted for students of any age.

Student activities are incorporated throughout the book, set aside by a change in typeface and layout. The center inserts, which consist of the Glacier Game and game cards and the Ice Age Animal Cards, can be removed, photocopied, and cut for classroom use.

Teachers are invited to further supplement both the film and this booklet with a variety of maps, globes, and books about Alaska and, of course, visit to the 49th state. Visiting packets, photographs and maps, and other information about the state are available at no charge from the Alaska Division of Tourism (write to State of Alaska, Division of Tourism, P. O. Box 110801, Juneau, AK 99801-0801).
BEFORE YOU WATCH THE FILM

MAP STUDY
Locate Alaska on a map or globe. Investigate its:
- distance from the rest of the continental United States
- size
- topography
- bodies of water and rivers
- distance from Hawaii
- longitude and latitude
- location of cities and towns

POOL KNOWLEDGE
Talk about what you already know about Alaska. For instance, what animals do you expect to see in the film? Types of terrain? Habitats? Weather patterns? Ask students to remember their expectations as they watch the film.

Provide the following background information: Alaska was a Russian territory until 1867, when the United States purchased what was called “Seward's Folly” and “Seward's Icebox” from Russia. It remained a territory until 1959 when it became the 49th state. Alaska is the largest state, with an area of 591,004 square miles. In comparison, the next largest state, Texas, has an area of 267,449 square miles. Alaska's population is among the smallest, numbering about 587,000 at the 1990 census.

TOPIC 1: ALASKA’S NATIVE PEOPLE

ALASKA’S NATIVE PEOPLE
Alaska is the location not only of a variety of climate and habitat types. It is also the ancestral home of four different groups of Native people. Just as non-Alaskans often think of the arctic when they think of Alaska, so they also think of Eskimos as Alaska's only indigenous people. Aleuts, Athabaskan Indians, and Indians from the Panhandle region of the state also trace their ancestry to Alaska. Before Europeans arrived, 20 different languages were spoken in Alaska.

A few definitions will help explain this map:

NATIVE: In Alaska, the term “Native” holds a special meaning. While anyone born in the state is a “native of Alaska,” an “Alaska Native” (with a capital “N”) is the descendant of one of the four indigenous peoples who settled there thousands of years ago.

ESKIMO: This is a general term given to the northern people by a neighboring, unfriendly group. It is considered derogatory in Canada and Greenland, where the accepted term is “Inuit” rather than “Eskimo.” In Alaska, however, “Eskimo” is acceptable, though considered imprecise. There are four distinct Eskimo languages spoken in Alaska, and it is better to refer to people by their linguistic name than by the general and foreign term “Eskimo.”
YUPIK: This is the Native name for those Eskimos who speak either Central Yup’ik or Siberian Yupik, which are closely related but different languages. “Yupik” translates into English as “real people.”

INUIT: This is the favored term in Canada and Greenland, in the Native language, for the people commonly referred to as “Eskimos.” The language of the Inuit people is Inuktitut.

IÑUPIAQ: This is the Native name of the northern Alaskan Eskimo language (it is the same language as Inuktitut, though a different dialect), and also the word for a single northern Eskimo person. There are two forms of plural in the Iñupiaq language: two people are “Iñupiak,” while three or more are “Iñupiat.” Note that differences are indicated by the ending of the word, just as in English an “s” is often added to the end of a word to indicate the plural.

UNANGAN: This is the name by which the people of the Aleutian Islands called themselves. Much more common nowadays is the word the Russians gave to the inhabitants of western and southwestern Alaska: A leut. The people called “A leuts” spoke several different languages, including Unangan and Sugpiaq, today also called A lutiq. The two languages are in the same language family, although A lutiq is an Eskimo language, very close to Central Yup’ik in grammar and vocabulary, while Unangan is not an Eskimo language. The Eskimos and A leuts shared the same ancestors, but they do not consider themselves the same people today, and are careful to distinguish between “A leut” and “Eskimo” when identifying themselves.

INDIAN: Like “Eskimo,” this is a term that was foreign to the Native people themselves, and was given to all indigenous Americans by the earliest European explorers in the 15th and 16th centuries. Alaskan Indians, like those in the rest of the country, are descendants of different ancestors than are Alaskan Eskimos. Those ancestors traveled to North America at different times than did Eskimos, and the two sets of languages are completely unrelated. Two groups of Indians are indigenous to A leut: A thabaskans and Southeastern Indians (Tlingit, Haida, and Tsimshian).

ATHABASKAN: Yet another name given to a group of people by foreigners, the term derived from the description of a lake in northwestern Canada where a group of A thabaskans lived. The Athabaskan language family is very large, consisting of eleven languages spoken in A leut and many more in Canada, as well as some in Oregon and California and the Navajos and A paches in the southwestern United States. Because “A thabaskan” is not an English word, students will find its spelling varies. The most common spellings are “A thabaskan,” “A thabascan,” and “A thapaskan.”

TLINGIT: This term derives from the people’s name for themselves, and means “people of the tidelands.” Tlingits, Haidas, and Tsimshians, as well as groups in British Columbia and along the coasts of Washington and Oregon, were the carvers of totem poles and elaborate and beautiful woodwork. The Tlingit homeland is Southeastern A leut, which they share with two other Indian groups, Haidas and Tsimshians, who moved north from British Columbia in the 18th and 19th centuries respectively.

Non-Alaskans are often confused by the use of the word “Southeastern” to refer to the state’s Panhandle and “Southeastern Indians” to describe the Tlingits, Haidas, and Tsimshians who historically lived there. The region is the southeastern part of the state, but A mericans from the rest of the continent call it the Northwest. In fact, many books refer to the Indians of the region as “Northwest Coast Indians.” Alaskans understand that these seemingly opposite names refer to the same area and people, but from two different points of view.

ACTIVITY

Look at a topographic map of A leut and find the mountain ranges, rivers, and other natural barriers and transportation corridors in the state. Then compare the topographic map with the climate and Native languages maps. How do language boundaries relate to A leut’s topography and climate?
ALASKA’S GLACIERS TODAY

Today about 30,000 square miles of Alaska (about 5% of Alaska’s area, nearly the size of South Carolina) are covered by glaciers. Alaska has more than 95% of the glaciers in the United States. The largest concentration of glaciers is not in the coldest (arctic) region, but in Southcentral and Southeastern Alaska. Why? Since huge amounts of snowfall are needed to build and maintain glaciers, there are few glaciers in the far north where precipitation is low.

ALASKA’S GLACIERS IN THE PAST

During the Pleistocene Epoch (1.8 million to 10,000 years ago), often called the Ice Age, more than 50% of Alaska was glaciated. The unglaciated half of the state included much of the interior of Alaska that makes up the great Yukon River drainage. This region remained free of glaciers not because temperatures were warm, but because snowfall was so light that glaciers could not form.

The Ice Age was not a single, two-million-year-long winter. Rather, temperatures fluctuated from extreme cold to warmer periods, some of which were actually warmer than today. These warmer periods, called interglacials, caused the glaciers to melt and shrink, while colder weather brought more snow that caused them to grow. The maps on this and the next page show North America during four periods within the Pleistocene Epoch, each with a different glacial pattern. Note that the dates are given as “years ago,” often abbreviated by archaeologists and paleontologists with the initials “BP (Before the Present),” rather than the modern dating conventions (such as 1964 AD, 332 BC).

ACTIVITY

Practice converting AD and BC dates into BP figures.

Sea level changed during the Ice Age because much of the earth’s water was trapped as ice in glaciers rather than as liquid filling the oceans. These maps show changes in glaciation and sea level in North America and the Bering Strait region during four phases of the Pleistocene:

This map shows the period from 35,000 to 40,000 BP (years ago), a relatively warm time during the Ice Age. North America and Asia were separated, and only the Southeastern and Southcentral portions of Alaska were glaciated.
This map shows the period from 26,000 to 28,000 BP when temperatures were colder than in the previous map, warmer than the following one. About half of Alaska was glaciated. There was an area free of glaciers between Alaska and what is now the continental United States through which plants and animals, including human beings, migrated south.

The map to the right shows North America during the last period of extremely cold weather, about 20,000 BP. Note that Asia and North America were connected because sea level was much lower than it is today. However, because glaciers extended across the entire North American continent, no plants or animals could migrate from Siberia into what is now the United States.

Even in the recent past, the size of Alaska's glaciers has varied. A "Little Ice Age" brought much colder temperatures throughout the world than at present. For instance, the Thames River in England froze each winter, something that has not happened in many years. Alaska's glaciers grew until the end of the Little Ice Age in the late 1700s and early 1800s. Since then, most have retreated.

The map to the left shows the period between 15,000 and 17,000 BP, as the earth was warming and glaciers were receding. By 10,000 BP, Beringia was completely submerged under what is now the Bering Sea.

Observers made detailed records of the changes in the size of the glaciers, from the days of the Little Ice Age to the present, in Glacier Bay. When Captain James Cook and his midshipman George Vancouver first sailed past the region in 1778, the bay did not exist. Instead, the explorers saw a wall of ice, the terminus of a huge glacier.

Sixteen years later, when Vancouver was captain of his own ship, his lieutenants Whidbey and LeMesurier sailed past the same spot and found a bay six miles deep. One hundred years after Cook's first sighting, John Muir found that the bay was 40 miles deep.
ANATOMY OF A GLACIER
Glaciers begin as snowfall. They form where more snow falls than melts each year. But glaciers are made of ice, not snow, so the snow must undergo a change before a true glacier forms. This happens when the weight of new snow is so great that the structure of the water crystals underneath changes. Within the first two months, snowflakes lose their six-sided shape and become grains of ice called firn. Then, over a number of years, firm grains merge to form large ice crystals that are so dense that water and air cannot pass through them. At this stage, the ice appears a beautiful, deep blue. This is because it is so dense that it absorbs all colors of the spectrum except blue, which it reflects back. As glacial ice is exposed to the open air, small cracks appear and air is allowed in. Because it has become less dense, the ice loses its blue color.

Glacier ice changes in another way as it is exposed to the air: It makes noise. Bubbles of air are trapped within the glacier, and through the millennia, as more and more snow is deposited above them, these bubbles are placed under more and more pressure. When the ice is removed from the glacier -- for instance, when an iceberg breaks off from the glacier's terminus -- the pressure is instantly released and the air bubbles break, resulting in pops. Newly exposed glacial ice, called "ice sizzle" or "bery seltzer," sounds like a bowl of Rice Krispies as milk is poured over the cereal.

ACTIVITIES
Using a prism, notice how light separates into different colors.

A demonstration of changes in the color of glacial ice, save a piece of glacial ice (if you are lucky enough to live near a glacier!) in the freezer. Because it will be exposed to air, it will soon be colorless, like ice cubes created by freezing water, even though it will never have melted.

A sound similar to bergy seltzer can be created by running water over an ice cube that has just been removed from the freezer. In this case the noise is caused not by the popping of air bubbles, but by the cracking of the ice itself as the warmer water melts it along fault lines.

ANATOMY OF A GLACIER, CONT.
Glaciers begin where temperatures stay below freezing year-round, a situation that is currently most common in the mountains. Glaciers move downhill, pulled by gravity. When more snow falls than melts and the ice field grows, the glacier is said to "advance." In other words, the front (also called the toe or terminus) of the glacier creeps downhill as new snow is added to its base in the mountains. When the terminus of the glacier melts faster than new snow and ice are added to the base, the glacier is said to "retreat." Its toe seems to move backward and uphill, exposing new ground beneath it as it melts. In fact, the glacier is not moving backward -- it can only move downhill, following gravity. But because it is melting faster than it is moving forward, it seems to be retreating.

A glacier's center and upper layers move faster than the lower layers and sides that rub against the walls and floor of its valley. This uneven rate of travel causes breaks, or crevasses, in the surface of the glacier. Often crevasses are concealed by snow bridges, but these snow walkways can be extremely unstable and dangerous.
While the upper layers of the glacier may melt in the summer sun or become coated with snow in the winter, the bottom layers of ice melt from friction as the glacier moves across the ground. These layers then refreeze around bits of dirt and rock they pick up, resulting in a slippery but hard surface. As the glacier moves downhill, its ice and embedded rock scrape away soil until bedrock is exposed. This scouring action not only removes topsoil, but actually changes the shape of the land, scraping the valley into the shape of a giant U. You can tell whether a valley was glaciated or not by looking at its shape: If the sides are evenly sloping and smooth and the bottom is nicely rounded, the valley was once covered by a glacier. If the valley has a V-shape, it was caused by many years of erosion as river water coursed through it.

A glacier's terminus melts unevenly. The top surface may be warmed by the sun, causing pools of water to accumulate on the ice. This water then flows over the surface and down crevasses to the bedrock beneath the glacier, and eventually to the terminus itself. The water may form spectacular waterfalls at the toe of the glacier, or it may become concentrated in a river that flows beneath the glacier itself. The Tlingits have many legends about their ancestors coming to the coast from the interior by traveling down under-glacier rivers.

A dramatic form of glacial melting shown in the film is called “calving.” Calving occurs when a large block of ice breaks off from the glacier's terminus with a loud crack or boom, then sends out a huge splash of water if the toe is at water's edge. The separated ice blocks form huge icebergs that are deep blue where the ice has just been exposed to the air, white where it has been exposed for some time, and brown or black where dirt and rocks have accumulated as the glacier has moved across the land. Although icebergs may be the size of small islets, they are quite unstable. Nine-tenths of their volume lies beneath the surface of the water. A part of the berg melts, its shape changes and it can tip and overturn as it rebalances itself in the water. Boaters must be cautious around calving glaciers and icebergs.

**ACTIVITIES**

**Glacial movement** can be simulated using modeling clay as a mountain and cornstarch as the glacier. Model a wedge out of clay. Scoop a hole out of the top of the wedge to simulate a cirque, or bowl-shaped depression where the glacier will start. Build up a small clay barrier at the bottom edge of the depression to hold back the ice. Use the flat side of a ruler, press a deep trough down the sides of the wedge leading from the cirque to the table. Smooth the corners of the trough. Prepare a thick mixture of cornstarch and water and pour it into the cirque, being careful not to let it spill out; you may need to tilt the clay wedge until you're ready for the glacier to begin moving. Place five paper dots (made by punching out holes from colored paper) evenly spaced on the leading edge of the cornstarch, and allow the glacier to begin to move. Every 15 seconds, mark with colored toothpicks (coordinated with the colors of the dots) the progress of the central, leading paper dot and the back two, or trailing dots. When the glacier has reached the bottom of the clay wedge, watch its movement as it fans out. Discuss the glacier's movement; did all dots move at the same rate? Why or why not? What happened to the shape of the glacier as it moved downhill?

**The Glacier Game**, inserted in the center of this booklet, is about rates of glacial movement. The object of the game is to travel from the glacier's base to its terminal moraine or its terminus at the sea. To prepare the game, color and laminate the board and the game cards. Cut the game cards, shuffle them, and place them in a pile. Supply a coin and game pieces (buttons, Bingo markers, pieces of colored paper). Players flip the coin before each move; if it comes up heads, they move 1 space forward; if tails, they move 2 spaces. When players land on a square marked with a snowflake or ice crystal, they pick a card and follow its directions.
WHAT WAS BERINGIA? WHERE IS IT NOW?
The earth’s sea level dropped more than 150 feet many times during the Pleistocene Epoch, each time leaving high and dry a broad plain between Siberia and A laska. The land that connected Siberia and A laska during these periods is called either the “Bering Land Bridge” or “Beringia” (see the maps on pages 5 and 6 of this guide). Scientists prefer the latter term because “land bridge” sounds like a narrow foot bridge over water. In fact, the “bridge” was nearly 1,000 miles across. The humans and animals living there were not aware that they were crossing from one continent to another, for the land was simply a continuation of the steppe and tundra on either side of the connection.

Beringia included the unglaciated parts of A laska and Siberia as well as what is now the bottom of the Bering Sea. Its name comes from the Bering Sea, which in turn was named for a Danish explorer who sailed for the Russian N avy. He was searching for the land the Russians knew lay beyond the waters that lapped the shores of Siberia. Vitus Bering first sailed the sea that now holds his name in 1728. During his second voyage, in 1741, he sighted A laska for the first time. Europeans gave him credit for discovering A laska, though people had been living there for thousands of years. The true discoverers were the ancestors of today’s N ative people who lived in Beringia.

ACTIVITY
M ost globes show ocean depth, depicting the shallowest areas with a light blue color. Find A laska on a globe. Notice the light area between A laska and eastern Siberia, in what is now called the Bering Sea. Most of this part of the ocean floor is less than 40 meters (130 feet) deep; all of it is less than 70 meters (230 feet) deep. Therefore, a drop in sea level of only 130 feet would connect A laska and Siberia, making Europe, Asia, and North America one huge continent. This map shows ocean depths in meters at various locations within the Bering Sea.

Depths are shown in meters. One foot = .3048 meters.
Convert the meters into feet. Since there are .3048 meters in every foot, divide the meters by .3048 to learn the ocean depth in feet. For example, an ocean depth of 58 meters divided by .3048 equals 190.3 feet.

Draw a contour line on the map for every 10 meters of ocean depth. Using colored pencils, color the area within each contour line a different shade of blue. Match the contours with the chart below to learn how much of the Bering Land Bridge was exposed at different times during the last 30,000 years.

<table>
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<th>YEARS AGO</th>
<th>SEA LEVEL</th>
<th>YEARS AGO</th>
<th>SEA LEVEL</th>
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<tr>
<td>20,000</td>
<td>-118 meters</td>
<td>22,000</td>
<td>-117 meters</td>
</tr>
</tbody>
</table>

**WHEN WAS BERINGIA EXPOSED?**

Beringia was exposed whenever world temperatures were cold enough to cause huge ice sheets to cover much of the Northern Hemisphere. Scientists’ studies of Alaskan and Siberian soils and fossils show that plants and animals crossed from Asia to North America at least seven times over the past 10 million years.

**LIFE IN BERINGIA**

Beringia contained different plants and animals during the last part of Ice Age than are present in the Yukon River drainage today. Instead of boreal forests of birch and spruce, most of the land was covered by grassland, called steppe, and by areas of tundra. Woodlands covered only a very small portion of the easternmost river drainage.

Both steppe and tundra are cold weather habitats, and both are treeless. But there are differences:

- Tundra plants are adapted to cold, poorly drained areas. They grow slowly and have shallow roots. This means that when a tundra plant is eaten, or even walked on, it takes many years to grow back. Many tundra plants are poisonous to mammals.

- Steppe plants are adapted to cold, but even more, to dryness. Steppes are well-drained areas, so the roots of their plants can grow deep. This means that when steppe grass is eaten the plant itself survives and grows back the following summer. In addition, steppe grasses are edible, while many tundra plants are not, so the steppe can support many more animals, and many different kinds of animals, than can tundra.

The steppe habitat of the Ice Age, called the Mammoth Steppe after its most famous inhabitant, provided a home for many grazers, or grass eaters. The most common were the woolly mammoth, the bison, and several species of horse. Other herbivores and the carnivores that preyed on them included now-extinct mammals such as giant ground sloths, giant beavers, camels, steppe lions, short-faced bears, and sabertooth cats. Some of the Ice Age mammals that were adapted to tundra rather than steppe still roam Alaska. For instance, caribou are still common, and muskoxen, though at one time almost extinct in North America, have made a comeback. But the medium-sized mammal that had the greatest impact on the animals of the Mammoth Steppe has survived and even thrived in Alaska. This mammal is, of course, the human being.
**ACTIVITY**

The animal cards in the center insert show extinct Ice Age mammals. Many other Pleistocene species survive today. Research and make animal cards for these survivors. Include on each card a brief description of the animal, its main food source, its habitat, its primary enemy, and its group structure.

Use your cards and those included in this booklet to play a Concentration card game. Place the cards face down on the table. Each player turns two cards over. If they match, the player keeps the cards. The objective is to collect the most cards. Decide which characteristics must be matched before you play the game. For instance, you might decide that two cards are a match if both are grazers; or that two cards are a match if both are from the same mammal family (e.g., both are bears).

**WHY AND WHEN DID THE ICE AGE MAMMALS BECOME EXTINCT?**

Many Ice Age mammal species still survive in Alaska. These include small herbivores (plant-eaters) such as voles, lemmings, hares, pikas, muskrats, beavers, and ground squirrels; tundra grazers such as caribou, bison, Dall sheep, and muskoxen; and carnivores (meat-eaters) such as grizzly bears, lynx, wolverines, foxes, mink, and wolves. However, the woolly mammoth, steppe bison, saiga antelope, sabertooth cat, steppe lion, giant ground sloth, giant beaver, Alaska pony, short-faced bear, and camel became extinct in Alaska at the end of the Ice Age. These extinctions were caused by three factors: the flooding of much of the Mammoth Steppe, the loss of habitat because of climate changes, and the presence of human beings.

Many Pleistocene herbivores that depended on steppe grasses for food could not survive when the steppe disappeared and was replaced by boreal forest and tundra. Others had trouble moving over the rough terrain of the tundra and forest.

The carnivores that preyed on these herbivores would have suffered as their prey decreased. Not only was food more scarce, but the predators had to travel further afield to find it, and then had to run it down over uneven tundra rather than the flat, even steppe grasslands they had known in the past.

Environmental changes can explain much about the massive extinctions that occurred in Alaska about 10,000 years ago, but they cannot explain everything. After all, there have been environmental changes at other times during the earth's history without widespread extinctions. But this time there was a crucial new element: human hunters. For the first time in Alaska, a species of animal was able to kill not just those animals it could personally run down, but also those within a spear throw or an arrow's shot -- or even within walking distance, as long as a trap or deadfall was placed along the animal's habitual trail.

The animals that survived the close of the Ice Age were those that were most flexible in their eating and living habits. Omnivores fared better than strict carnivores; animals that could travel long distances over uneven terrain found food more easily than animals adapted to level-ground locomotion; herbivores able to subsist off both grasslands and tundra were more suited to the new environments than were the steppe specialists; and animals that either lived in large herds that would be little affected by human hunting, or were able to hide or run from human hunters withstood human predators better than those that depended on large size alone.

**HUMAN MIGRATIONS**

Humans came to North and South America over the Bering Land Bridge, not all at once, and not in a single long migration, but rather in a number of trips taken by many separate, probably small groups. One theory is that there were three major migrations. The first involved the ancestors of most of the Native Americans now living in North and South America. The second involved the ancestors of today's Athabaskans, most of whose descendants still live in the north. The third migration was made by the seafaring ancestors of the Eskimos and Aleuts, people who followed the retreating coastline of Beringia as the glaciers melted and sea level rose.
The distance between Alaska and the tip of South America is about 16,000 miles, so if a group moved at a rate of 25 miles a year, its generations of descendants could walk the entire length of North and South America in fewer than 700 years. The problem with this scenario is that early humans did not have a map with an arrow pointing to Patagonia. They were not racing south, intent on reaching the end of the road, so there is no reason to believe they moved in any single direction at a regular pace. Rather, they were undoubtedly busy living their lives, hunting and gathering food, raising children and caring for elders. If these early Americans were like most people today, they were most comfortable living in an area with familiar plants and animals. They must have moved south only when other people pushed them, when resources became scarce in their home territory, or when the odd explorer returned home with stories of abundance just over the next ridge or in the next river valley.

People could have moved to Alaska from Siberia any time after 35,000 BP, but they could have traveled from Alaska to the rest of the continent only during two stretches within the Ice Age:

- **35,000 to 20,000 years ago.** When the ice-free corridor between the Laurentide and Cordilleran ice sheets first existed; before that, there were no humans in northern Siberia.
- **14,000 to 10,000 years ago.** The ice-free corridor reopened about 14,000 BP, but by 10,000 years ago the glaciers had melted, sea levels had risen, and Beringia was again covered with water. Therefore, until the invention of the airplane, for the last 10,000 years the only mode of transportation between the two continents was by boat.

Archaeologists have searched for tools, bones, campsites, and house remains of these earliest voyagers to the New World. The oldest evidence of humans should be buried farthest north, either in the now-submerged Bering Sea bottom or in Alaska. The remains should be younger in South America. However, the archaeological record is puzzling: The oldest site found in Alaska is only about 11,500 years old, while a site almost as old (11,000 years) has been found at the tip of South America. Archaeologists have concluded that there must be older sites in Alaska that have not yet been found.

These early human travelers to the New World were far more advanced than the comic-book image of “ape-men” or even European Neanderthals. These were modern human beings — Homo sapiens — who used fire, knew how to make warm clothing to fit the individual, and how to build shelters to take advantage of available natural materials. They were master hunters and knew which plants were edible, which were poisonous. They were flexible and inventive, able to travel with few belongings since they knew they could make whatever tools they needed when circumstances required.

**ACTIVITY**

The film shows a group of Ice Age hunters following a herd of caribou. The hunting tools these people used had to meet two requirements: they had to be easy to carry, and they had to be easy to make on the spot. These requirements were met in one of the most ingenious technologies of Alaska’s earliest humans: the microblade.

Microblades were tiny, sharp slivers of volcanic rock, usually either obsidian or chert. They were inserted along the edges of bone or antler spear heads, making the weapons deadly tools that caused the prey to bleed heavily. To make a microblade, the flint knapper would find a good-sized block of stone and chip away at it until it was about the size and shape of a hockey puck. He or she (we don’t know who made the tools, but historically, men usually took on this task) then used a mammal rib bone to strike thin blades from the sides of this core piece of rock, scalloping its edges with each blow. A well-prepared core would yield dozens of blades.

You can make replicas of arrowheads and microblades using soft wood or clay for the points and bits of broken shell, thin pieces of plastic (such as punched-out notches from videotapes or halved tiddly winks), for the chert or obsidian blades. Experiment with spearhead shapes and the size and placement of the microblades.
EXPLANATIONS AND MYSTERIES

Northern Lights, or the aurora borealis, occur when charged particles (electrons or protons) from the sun collide with gas molecules (primarily oxygen and nitrogen) high in the earth’s atmosphere. The collisions cause the gas molecules to emit light, the color depending on the type of gas. The visible part of this electro-magnetic activity takes place about 50 or 60 miles above the earth’s surface.

Many people have reported hearing the aurora when it is intensely active, but no one has recorded the sounds. As a result, most scientists are skeptical; they argue that any sound produced by the aurora would take 5 minutes to travel to the ground, and in any event that the energy involved is too small to produce sound waves strong enough to be heard. Nonetheless, similar reports have come from all over the world and over a period of 200 years. Scientists continue to investigate this mystery of the singing aurora.

Charged particles from the sun continuously bombard the atmosphere, but they do not always produce visible auroral displays, for several reasons:

- The aurora cannot be seen in the daytime because of the brightness of the sun.
- The aurora may be hard to see near brightly lit cities.
- The aurora is usually visible only in areas close to the two poles, guided there by the earth’s magnetic field in much the same way that iron filings arrange themselves around a bar magnet.
- A single collision between a charged particle and a gas molecule produces a flash too weak to be seen. The total particle flow must equal at least 100 million particles per second per square centimeter of the sky for a visible display.
- The amount of particle flow varies over the days and years. Short cycles occur about every 27 days, the length of time it takes the sun to revolve around its axis. Longer cycles coincide with periods of intense sunspot activity, which occur about every 11 years. Extremely vivid displays should occur in about 2002, 2013, and 2024.

Alaska Natives of the past, like people today, were awed by the beauty and power of the aurora. There were perhaps as many stories about the aurora as there were Native settlements, but one common set of narratives describes the aurora as a giant football or soccer game in the sky, played by sky-beings or the spirits of the dead. Like hundreds of European observers, Alaska Natives reported hearing the aurora. They taught their children to respect all of nature; for instance, people should not whistle at the aurora, for by calling out to it, they could unleash a power they could not control.
Survival in the arctic and subarctic is a challenge. The main problem is the extreme cold. But there are others; herbivores must also deal with limited food for browsing and grazing, efficient predators, and summer hordes of insects. Carnivores must deal with cyclical decreases in the game they depend on. Both herbivores and predators compete within their own species for mates, and sometimes for food. All animals must protect themselves from human hunters, and many are threatened by loss of habitat as people erect buildings on the land.

Alaskan animals have adapted to the challenges of the natural world in a number of unique ways. Observe the animals shown in the film and decide which of the following adaptations or strategies has helped each to survive.

**CAMOUFLAGE**

In many animal species, babies are born with dappled brown coats so they can blend into the brush or forest. In Alaska, the arctic fox and Sitka black-tailed deer follow this pattern. Other Alaskan animals change color as the seasons turn. Several species have adapted to both summer and winter by shedding mottled brown coats in the fall and growing snowy white ones in their place. Examples include snowshoe hares, arctic hares, ptarmigan, and weasels (called ermine in their winter white phase).

**FUR AND FEATHERS**

Both land and sea mammals of the north develop heavy winter fur to protect them from cold temperatures. The fur grows in two layers: a soft, dense underfur insulates the body from heat loss, while long, slick outer hairs (called guard hairs) shed water, snow, and wind. Beavers, muskrats, minks, sea otters, and land otters have adapted to cold climates in this way.

The fur of some animals has unique characteristics to deal with Alaska's weather. For instance, wolverine fur is resistant to frost. For this reason, use it to make fur ruffs for parka hoods, since the wearer's breath will not condense on the fur. Caribou hairs are hollow, providing both buoyancy for swimming and extra insulation for arctic winters. Because of this property, caribou skins are used as sleeping bags and parkas. The underwool of the muskox is so soft it is knitted into luxurious scarves and hats. Seal fur is slick and sheds water, and so is often used in arctic areas to make boots, called mukluks. The porcupine's quills are actually modified hairs that are filled with a spongy material and tipped with tiny barbs. These quills protect the rodent from predators.

Mammals are not the only Alaskan animals that have adapted to the cold climate with protective covering. The ptarmigan, Alaska's state bird, grows feathers all the way down its legs and on its toes.

**BODY SHAPE AND SIZE**

Many Alaskan animals have a compact body type that conserves heat. For instance, the lynx has short, furry ears unusual in the cat family. Snowshoe hares and arctic foxes have similarly short ears. Sea mammals are protected by a thick layer of fat, or blubber, that insulates them from cold waters. Other mammals are adapted for specialized travel requirements. Lynx and snowshoe hares have large feet that spread their body weight, keeping them from sinking into deep snow. Caribou hooves are flexible, making quick travel over uneven tundra or in deep snow possible, and useful for swimming across rivers and lakes. The long legs of moose allow them to step over fallen trees and dense bushes as they browse in the forest.
HIBERNATION AND FREEZING
During hibernation, the animal's body functions decrease almost to nothing. This allows hibernating animals to survive without food or water during the lean winter season. Alaskan hibernators include black bears, brown bears, mice, and marmots.

Other animals actually freeze during the winter and then revive when they thaw out in the spring. Normally, freezing would kill an animal, since ice crystals would form inside cells and burst the cell membranes. But some animals, including certain caterpillars, fish, and houseflies, produce a chemical antifreeze in their cells that either prevents freezing or retards the formation of ice crystals within cells.

ANTLERS, HORNS, AND TEETH
Although antlers, horns, and specialized teeth are not unique adaptations to cold climates, they are important survival tools for many Alaskan animals. Antlers are different from horns in one important way: they are shed each year, growing back in the summer and fall, while horns are not shed. Moose, caribou, deer, and elk grow antlers, which they use in mating displays, as protection from predators, and in foraging for food. Muskoxen, Dall sheep, and mountain goats grow horns, used in mating displays and defense from predators.

Animal teeth have evolved according to diet. For instance, grazers' molars are large and flat, perfect for grinding up grass before it is swallowed. Browsers' molars are large, but have ridges, since they must grind up woody branches and bark. The beaver's front incisors never stop growing, but are worn away by constant gnawing on wood. Toothed whales such as killer whales and belugas have carnivores' teeth, sharp for biting and chewing meat. Baleen whales such as humpbacks and bowhead whales have long flexible strips of baleen instead of teeth, perfect for filtering tons of tiny plankton, krill, and small fish for food. Walrus tusks are used in defense of life or mates and as tools for digging clams on the bottom of the sea.

BEHAVIOR
Each animal species has unique behaviors that allows it to survive in its habitat. Examples include different social organizations, such as flocks or herds (geese, cranes, caribou, sheep, goats, elk, muskoxen, fur seals, walrus), family groups (eagles, wolves, whales, land otters, foxes, beavers), solitary life (moose, lynx, wolverines, porcupines), and colonies (many rodents).

Other adaptive behaviors are defensive strategies. For instance, muskoxen form a tight circle around the herd's young when threatened by predators. The adults face the outside of the circle, showing only their horny brows and front hooves.

Still other adaptive behaviors include hunting methods, such as wolves' pack hunting, killer whales' and humpback whales' circles of bubbles that trap fish, and bears' use of their long claws to swipe salmon from streams.

Diet itself is an adaptive strategy. Grizzly bears can thank their varied diet of fish, small and large game, berries, and roots for their survival after the Ice Age. Their larger cousins, the short-faced bears, owe their extinction to the fact that they ate only meat, and when their prey became scarce the bears starved.
WHAT HAPPENS WHEN ADAPTIVE STRATEGIES AREN’T ENOUGH?

A nimals are not always able to adapt to environmental changes. A complete failure to adapt results in extinction of the entire species. For instance, 10,000 years ago many Ice Age animals became extinct due to changes in habitat and the presence of human hunters. The process is continuing; as more people move to Alaska they affect the lives of animals more and more, both by killing them for food and clothing and transforming their habitats into cities and roads. The following case studies show how people have affected animal populations in Alaska since the coming of the first Europeans in 1741:

**A leutian Canada geese** are a subspecies of Canada goose that nests only in the Aleutian chain. At one time they nested on most of the more than 100 islands, but were almost exterminated when Russians and Americans introduced foxes to the Aleutians. The plan was to breed the foxes for their furs. An unexpected result was that the foxes ate goose eggs, decreasing the worldwide population of Aleutian Canada geese from thousands to 800 by 1967. Beginning that year, biologists transplanted geese to fox-free islands, with the result that there are now more than 7,000 Aleutian Canada geese.

**Muskoxen** had disappeared from Alaska by the mid- or late-1800s, probably as the result of overhunting. In 1930, muskoxen survived only in Greenland and a few areas of Canada. That year, 34 were transplanted from Greenland to Alaska. As the herd grew, more were taken to other parts of Alaska, so that today there are almost 2,500 muskoxen in the state.

**The Steller sea cow**, a relative of the manatee, lived in the Bering Sea and fed on seaweed in shallow coastal waters. This mammal was so docile that it allowed humans to approach and shoot it at point-blank range. In 1741, Vitus Bering, a Danish sea captain working for the Russian Navy, was shipwrecked on an island in the Bering Sea. His men were able to survive on sea mammals, particularly the Steller sea cow. Russian hunters had completely exterminated the species by 1768.

**Bowhead whales** numbered in the tens of thousands before commercial whaling began in the 17th century. Between the 1600s and the 1900s, Atlantic Ocean bowheads decreased from 30,000 to 1,000. Alaskan populations are now increasing, thanks to an international ban on whaling. Today only Native subsistence hunters may hunt bowheads, and each year a quota limits the number of whales that can be taken. For instance, in 1993, 41 whales of the estimated 6,400 to 9,200 Bering Sea bowheads could be landed.

**Steller sea lions** are currently declining, although scientists do not know why. There are several theories: The Exxon Valdez oil spill of 1989 killed many fish and damaged much shoreline, perhaps killing many of the bottomfish the sea lions depend on. Or, overfishing in Alaskan waters may have had the same effect. According to a third theory, the recent decrease in sea lion numbers might be part of a natural cycle which will eventually complete itself and numbers will increase again.

**ACTIVITY**

Research other endangered species, both Alaskan and worldwide. Why did populations decline? What measures have been taken to protect them? What could have been done differently to prevent their decline?

Choose one of Alaska’s climate zones or habitats. Design an animal perfectly adapted to that region. Explain how it obtains food and water, protects itself, survives the natural elements, cares for its young, and travels.
Just as animals adapt biologically to their environments, so human beings adapt. But humans have an important tool that other animals do not possess: their culture. They can adapt their behavior and plans to existing situations, and even more valuable, can change at a moment’s notice.

Alaska’s people have had to adapt to the same environmental conditions as have other animals, but each cultural group has done so differently. Nowadays, common human adaptations in Alaska include large buildings with triple-glazed windows and natural-gas burning furnaces, heated cars, and down-filled parkas. In the days before Europeans arrived, Alaska’s people adapted in other ways. The photographs below and on the next page show four dioramas on display at the Anchorage Museum of History and Art. Each is a scene from the lives of a group of Alaska Natives in traditional times, before the coming of airplanes, telephones, and televisions:

**ATHABASKAN CARIBOU HUNT** (right and below)
In the film, a re-enacted Ice Age caribou hunt shows people sneaking up on a herd and throwing spears when the caribou panic. The Athabaskans developed a much more advanced and efficient way of hunting caribou. They took advantage of the yearly migrations that thousands of fattened animals make as they move from their summer calving grounds north of the Brooks Range to the winter feeding grounds in the forests south of the mountains. The herd follows practically the same route each year, so hunters traveled to certain places to wait for them. There they repaired miles of fences, called caribou surrounds, that they had previously built. Women and children herded the caribou along the fence while men shot the galloping animals with long arrows or stabbed them with spears. Other caribou were caught in snares set along the length of the fence.

Each fall the Athabaskans built temporary shelters and smoke houses. Much of the year’s supply of meat was gathered during this one hunt, so people worked around the clock to butcher, smoke, dry, freeze, and store the caribou meat.

The people hauled much of the meat back to their winter camps, carrying it on their backs or lugging it behind on small sleds. They left some meat at the fall camp site so that hunters traveling through in the winter would find provisions. The Athabaskans built several types of caches, including log cribs on the ground and elevated houselike structures that kept the food safe from scavengers.

**IÑUPIAT (Northern Eskimo) BOWHEAD WHALE HUNT** (see photograph top of page 18) The film shows part of a modern bowhead whale hunt. Although people use modern weapons and outboard motors today, the hunt has changed little in a thousand years. Iñupiat of far northern Alaska still depend for much of their protein on the bowhead whale.

Each spring and fall the bowheads migrate past the northern Alaska coast. Lookouts travel many miles out onto the sea ice until they come to an opening, or lead, in the ice where they can watch for whales. When the huge mammals are spotted, the lookouts radio back to the base camp. Immediately several crews in umiat (open skin-covered boats) head out to sea after the whales. The captain of a successful boat is praised and admired because of the bravery he and his crew showed and his generous gifts of meat to the rest of the villagers.
Using pulleys and block and tackle (and today, tractors and snowmobiles), the villagers haul the whale onto the sea ice. Bowhead calves weigh a ton at birth, and can grow to 120,000 pounds at maturity, so without the cooperation of the whole village, it is impossible to land a whale.

When a whale is landed, each family comes prepared with a hand-pulled sled (or, nowadays, a snowmobile) to carry home its share of meat and blubber. The captain's wife divides the whale meat according to strict rules, to be sure that each family receives a share. A huge feast and celebration for the whole the village follow.

UNANGAN HOUSEHOLD (right)

Photograph 4 shows a cutaway view of the inside of an Unangan house. The house was built upon a frame of driftwood and covered by a thick layer of sod and grass. Its floor was dug half-underground so that no drafts could chill the inside. The only entry was through a hole in the roof. Unangan houses varied in size; some housed as few as 10 related people, while others were home for 50 or 60 family members. People slept in the grass-matted areas along the outside walls and cooked, sewed, and played in the central area.

Aleutian Island settlements are on the coast. Few land animals live on the Aleutians, so in the past most of the food (except the roots, berries, and leaves of edible and medicinal plants) came from the sea. Besides sea mammals such as seals, sea lions, and whales, the Unangan depended on intertidal shellfish. Even the oldest and youngest members of the community could contribute to their families' food by gathering mussels, chitons, clams, sea urchins, and octopus.

No trees grow in the Aleutians, but the vegetation is lush and green. Each village was located with six factors in mind: sea resources (fish, sea mammals, and shellfish), salmon, fresh water, driftwood, a good lookout site, and an escape route from invaders.

TLINGIT SALMON FISHING (right and below)

The mountains of Southeastern Alaska rise almost straight up from the shoreline, so villages had to be perched on the coast. Surrounded by forest, the people built houses, boats, tools, even clothing from wood products. The region is the home of the totem pole, a log carved with the emblems, or crests, of the family that commissioned the pole. Traditional Tlingit houses were large enough to hold an extended family of up to 40 or 50 people.

Tlingit villages were located at the mouths of freshwater salmon streams. The people were expert fishermen who had mastered dozens of ways of catching fish, using everything from hooks to nets to weirs to fish traps. Both men and women gathered salmon, and women cleaned, dried, and smoked it for winter use. They then stored the meat in beautifully carved wooden boxes. Because salmon are so abundant and are a predictable, reliable food source, people could live in large permanent villages without fear of using up the resources. In addition, because fishing activities were concentrated in the spring, summer, and fall, people had leisure time each winter to stage elaborate ceremonies and carve breathtakingly intricate artwork.

An efficient way to obtain salmon was the fish trap/weir combination shown in Photograph 6. Salmon swim upstream to spawn, so the trap was placed with its mouth facing downstream, ready for the fish to swim into it. A circle of sharp sticks jutted into the center of the trap and kept the salmon from swimming out the way they came in. When the trap was full, it was emptied and removed from the river. This allowed some of the salmon to continue upstream to spawn. Tlingits were thankful for the steady food supply, and each year offered a thanksgiving celebration to honor the coming of the first salmon.
ACTIVITIES

Study the photographs on pages 16 & 17 and list the adaptations each shows to its environment.

Here is a list of adaptations humans have made to life in Alaska. Match the adaptation to the condition that inspired it. For instance, houses with slanted roofs would be an adaptation to a rainy climate. Why?

<table>
<thead>
<tr>
<th>ADAPTATION</th>
<th>CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Houses with slanted roofs</td>
<td>A. Rainy climate</td>
</tr>
<tr>
<td>2. Skin-covered kayaks</td>
<td>B. Bright sun shining on spring ice</td>
</tr>
<tr>
<td>3. Snowshoes</td>
<td>C. Slippery ice</td>
</tr>
<tr>
<td>4. Sod houses</td>
<td>D. Tall, thick forests</td>
</tr>
<tr>
<td>5. Wooden goggles with eye slits</td>
<td>E. Lots of mosquitoes</td>
</tr>
<tr>
<td>6. Fishnets</td>
<td>F. Lots of rivers in wooded area, difficult land travel</td>
</tr>
<tr>
<td>7. Harpoons with a rope attached</td>
<td>G. Very cold winters</td>
</tr>
<tr>
<td>8. Fur parkas</td>
<td>H. Coastline with no trees</td>
</tr>
<tr>
<td>9. Wooden houses</td>
<td>I. Many fish swimming in silty rivers</td>
</tr>
<tr>
<td>10. Birchbark canoes</td>
<td>J. Fast-swimming sea mammals</td>
</tr>
<tr>
<td>11. Painting the face with soot</td>
<td></td>
</tr>
<tr>
<td>12. Ice creepers or crampons</td>
<td></td>
</tr>
</tbody>
</table>

Adaptations to the environment: Now work in a small group to make a list of ten environmental conditions you are likely to find in Alaska. Find out how Alaska Natives adapted to them in the past. A list of books and magazines about Alaska Native cultures appears at the end of this guide.

Make up your own adaptations to the ten environmental conditions on your list. For instance, if the condition is “rocky ground with no trees,” you might come up with the adaptation, “Make houses out of rocks.” Swap lists of environmental conditions with other groups in your class and compete to see which group can research or invent adaptations most creatively or quickly.

Artifact functions: The term “artifact” refers not just to ancient, archaeological finds, but to any human-made or human-altered object. Explore the functions of various artifacts. For each modern item listed below, research a traditional Alaska Native artifact that served the same function. For instance, for the item “sunglasses,” you might list “ivory or wooden snow goggles.”

- sunglasses          ice crampons
- grocery bag         car
- down vest            snowmobile
- book                 electric drill
- baby carrier         rifle
- tape recorder         chain saw
- ship                 fishing net
- fishing net          steel trap
- steel trap           sewing machine

Draw pictures of the modern and traditional items, make them into cards, and make up a matching card game for younger students.

Drawings of implements

Answers to matching activity: 1-A; 2-J; 3-E; 4-F; 5-B; 6-K; 7-L; 8-I; 9-D; 10-H; 11-G; 12-C.
The earliest evidence of humans in Alaska dates to 11,500 years ago, but archaeologists believe people lived there earlier. Historians divide Alaska's history into three periods: the Precontact (from the first arrival of humans to Alaska to the time of contact between Native people and immigrant Europeans and Asians), the Russian period (1741 to 1867), and the American period (1867 to the present).

**PRECONTACT PERIOD**

Although there are no written records describing this period of Alaska's history, archaeologists know that many changes occurred among Alaska's Native people during the 11,000 years before they met the first Europeans. For instance, about 4000 BP, most Eskimos hunted land animals rather than sea mammals, burned wood rather than seal oil for fuel, and were nomadic rather than settled. About 2500 years ago this changed. People began living in large permanent villages. They invented and used pottery. They shifted their hunting from land mammals to sea mammals. They developed elaborate artwork, particularly in ivory carving. Alaska's other Native cultures went through similar changes and developments.

Through the centuries, the various Native groups came into contact with each other many times. They fought wars, married each other, and traded with each other. By the mid-18th century, a long trade network linked the Native people from British Columbia to interior Alaska to the Aleutian Islands to Siberia. People traded food, oil, tools, shells, obsidian, copper, iron, and furs.

**RUSSIAN PERIOD**

Vitus Bering's 1741 voyage to Alaska marked the beginning of the Russian presence in the territory. Russia named its new colony "Russian America." It was interested in Alaska only for the money it could bring. Siberian furbearing animals had been overhunted as fur hunters moved east across Asia, and Alaska was a new territory with fresh supplies. The Russians moved through Alaska from west to east, starting at the Aleutian Islands, traveling next to Kodiak Island and the Alaska Peninsula, then following the coastline down to Sitka in Southeastern Alaska. They eventually traveled up the Yukon and Kuskokwim Rivers and established trading posts in the interior.

During the first 50 years of the Russian period, many private fur companies competed with each other in the waters around the Aleutian Islands for the rich furs of the sea otter. They soon learned that the easiest way to get furs was to force Native men to hunt them. Alaska Natives knew the habits of the animals, the land and water, the best methods for hunting the animals, and, most important, they were skilled kayakers, a talent Russian hunters never mastered. Although Alaska Natives objected to this forced labor -- there was an organized uprising by Aleuts from four islands in 1763 -- the Russians outnumbered the Natives and took children as hostages to force fathers to work.

In 1799, the Russian government realized that sea otters and fur seals were being overhunted, so the tsar granted to a single concern, the Russian-American Company (RAC), the monopoly over all fur hunting in the colony. From that time the colony was governed by the chief manager of the RAC. He was helped by managers in several dozen trading posts, each home to only a handful of Russians and surrounded by a Native village of hunters and workers. By the mid-19th century many company jobs were held by Creoles, the children of Russian fathers and Native mothers. In fact, during the 126 years of Russian control, there were never more than 500 Russians living in Alaska. Although a small population of non-Natives allowed most Alaska Natives (except Aleuts) to live as they had done for centuries. The main changes in their lives were new goods from Europe and new, Russian, trading partners.
American Period
The Russian-American Company began losing money as the fur-bearing animals decreased. At the same time, the Russian government realized that it could not defend its colony in North America from the Americans and Canadians who were moving in ever greater numbers into neighboring territories. As a result, the Russian government agreed to sell Alaska to the United States. The transfer occurred in 1867.

For 17 years the United States did nothing with its new territory. Americans moved north, but there was no government or law enforcement. Only a few military patrols sailed the waters of Southeastern Alaska. An American fur company took up where the RAC had left off, serving as employers, storekeepers, judges, and juries in western Alaska. Commercial whaling increased in the Bering Sea.

Then gold was discovered in Southeastern Alaska, and the United States government finally began to pay attention to its new territory. The Organic Act of 1884 allowed for property ownership and schools. For three decades a series of gold rushes brought waves of non-Natives to Alaska, beginning in 1872 and continuing until 1902.

These gold rushes changed life completely for some Natives. For instance, in the Aleutian Islands, the old Russian school was demoted to an optional afternoon church school, and all children were required instead to attend the American school where they learned English and American culture. In western Alaska, whaling crews landed at age-old Native villages and brought trade goods, American ways, and American diseases. In the interior, thousands of Americans and Canadians in the river, and introduced new goods and ideas. Resident Athabaskans began to trade firewood needed to run the steamboats, along with warm parkas and boots, snowshoes, and meat in exchange for American goods such as cloth, tobacco, tea, sugar, and rifles.

According to the census of 1900, in ten years the number of non-Natives in the territory had increased from 6,698 to 34,056. Meanwhile, in 1900 there were 29,536 Native inhabitants, so for the first time there were more immigrants than Natives in Alaska.

Another large influx of immigrants occurred during World War II when military bases were built to defend against Japanese attacks in the Aleutian Islands. Then oil was discovered and between Alaska’s statehood (1959) and 1980 thousands of workers moved north to work in the oil fields. Today Alaska Natives make up only 14.7% of the state’s total population.

Activity
Draw a scale-model timeline that includes the following information (and any other dates you wish to add; examples might be dates of volcanic eruptions or the establishment of various settlements). Illustrate the timeline and display it in the school hallway or classroom wall.

35,000 to 20,000 years ago: both the Bering Land Bridge and the ice-free corridor through Canada existed; humans may have migrated south
14,000 to 10,000 years ago: both the Bering Land Bridge and the ice-free corridor again existed; humans migrated south
11,500 years ago: oldest known archaeological site indicating human habitation in Alaska
10,000 years ago: many Ice Age animal extinctions
8,400 years ago: oldest archaeological site in the Aleutian Islands
4,000 years ago: ancestors of today’s Eskimos lived as nomads, hunting primarily land animals
2,500 years ago: ancestors of today’s Eskimos began building large permanent villages, changed to hunting sea mammals

early 1700s: a series of wars broke out among the Yup’ik Eskimos in southwestern Alaska, causing widespread movements of people south onto the Alaska Peninsula, accompanied by more warfare

1741: Vitus Bering sighted Alaska and claimed it for Russia
1763-64: Aleuts rebelled against the Russian fur traders
1778: Captain James Cook journeyed to Alaska
1784: Kodiak established
1786: Russians found Pribilof Islands
1794: Captain George Vancouver sailed past Glacier Bay
1799: Russian-American Company was given a monopoly over the fur trade in Alaska and became the government in the colony
1804: Sitka established
1867: United States bought Alaska
1872: Gold found near Sitka
1880: Gold discovered at the future site of Juneau
1884: Organic Act (passed by US Congress) brought laws to Alaska
1896: Gold discovered in Dawson City, Yukon Territory (Canada)
1898: Gold discovered on the beaches of Nome
1902: Gold discovered on the banks of the Chena River; Fairbanks established
1911: Fur seal treaty signed by US, Great Britain, Japan, and Russia
1924: Alaska Natives awarded United States citizenship
1942: Dutch Harbor in the Aleutian Islands attacked by Japanese
1942-3: Al-Can Highway connecting Alaska to the Lower 48 built
1959: Alaska became the 49th state
1964: Alaska Earthquake, March 27 (Good Friday)
1968: Discovery of oil on the North Slope
1971: Alaska Native Claims Settlement Act passed; Alaska Natives' lands formally deeded to them
1974-7: Construction of Trans-Alaska Pipeline

**Ancient History**

- **Bering Land Bridge 35,000-20,000 BP**
- Oldest habitation site in Aleutian Island 8,400 BP
- Ice Age animal extinctions 10,000 BP
- Oldest habitation site found in Alaska 11,500 BP
- Nomadic Eskimo hunters 4,000 BP
- Eskimo settlements; sea mammal hunts 2,500 BP
- Yupik wars early 1700s

**Recent History (1741-present)**
SELECTED BIBLIOGRAPHY FOR YOUNG PEOPLE

GENERAL SOURCES
Alaska Geographic Society
PO Box 93370
Anchorage, AK 99509
(publishes quarterly journals on specific topics relating to Alaska's geography)

Alaska Native Language Center
Box 900111
University of Alaska Fairbanks
Fairbanks, AK 99775-0120
(publishes original oral traditions in the Native language and English translation)

Smithsonian Institution Press
c/o Superintendent of Documents
US Government Printing Office
Washington, DC 20402
(The Handbook of American Indians series is an invaluable reference for teachers)

University of Alaska Press
PO Box 756241
University of Alaska Fairbanks
Fairbanks AK 99775-6240
(specializing in Alaskan human and natural history and culture)

ALASKA'S GEOGRAPHY AND NATURAL RESOURCES

A laska's Whales and Whaling, V. 5, N o. 4
A urora Borealis, V. 6, N o. 2
A laska's National Interest Lands, V. 8, N o. 4
A laska's Glaciers, V. 9, N o. 1
K atmai C ountry, V. 16, N o. 1
A laska's Weather, V. 18, N o. 1

A laska's Volcanoes, V. 18, N o. 2
A laska: T he G reat L and, V. 19, N o. 2
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VIDEO


The mastodon was an elephant that lived in Alaska during the warmer periods of the Pleistocene. It was a browser—i.e., it ate woody plants, rather than grass, and lived in forests. It was hairy, and sported a long trunk and tusks. Its huge size protected it from predators.

Camels inhabited the Mammoth Steppe, thriving most when conditions were driest during the coldest part of the Ice Age. Related more closely to llamas than to Middle Eastern camels, the Alaskan camel ate almost any type of vegetation, from grasses to woody plants. It was probably prey to many of the cats, wolves, and bears that lived on the steppe.

The saiga antelope was a grazer well adapted to the Mammoth Steppe. More closely related to sheep and goats than to antelope, the saiga still survives in parts of Asia, but became extinct in Alaska at the end of the Ice Age. It lived in herds and was probably prey to the cats, wolves, and bears that lived on the steppe.

The giant beaver was as big as a modern black bear. It inhabited Beringia during warmer periods within the Pleistocene, living in swamps and eating water-loving plants. Its slow walk on land would have made it easy prey to any of the larger Ice Age predators.

The giant short-faced bear was probably the fiercest of the steppe predators. It was twice the size of the modern grizzly, but was leaner and longer-legged. Archaeologists believe that the short-faced bear got most of its food by scavenging the kills of other predators rather than hunting itself. Its size and huge teeth would have scared other animals from the carcasses. This animal had no known predators.

Two species of wild horses lived on the Mammoth Steppe, the small Alaska pony and the Alaska wild ass. Mummies of the wild ass show that it was chestnut-colored with a blond tail and mane. Both species were grazers, as happy with older, low-quality brown grass as with new spring shoots. Wild horses were prey to steppe cats, wolves, bears, and probably people.
The woolly mammoth was a short, hairy elephant that ate steppe grasses. It had a trunk and long ivory tusks, but unlike the modern elephant, its trunk was split at the end into two fingerlike parts, and it sported a topnotch of hair. The mammoth’s main enemy was the human hunter.

The giant ground sloth was a herbivore related to the modern sloth. It lived in forest areas of Beringia during the warmer periods of the Pleistocene. It was the size of a Volkswagen Beetle, but when it stood on its hind legs it could reach 15’ into the air. Its height, along with its 8” claws, suggest that this animal ate the tender shoots at the tops of trees and dug roots for food. The claws were probably also used as protection against predators.

MAKE YOUR OWN PLAYING CARD
Draw your own animal and a brief explanation of that animal from your study of this workbook.

The sabertooth cat lived in the brush and ravines of the Mammoth Steppe. It had short, strong hind legs that gave it a powerful spring as it attacked caribou or antelope, but the legs were not built for long-distance tracking or running. Its long, sharp teeth cut into meat with ease, serving as both a hunting tool and protection against other predators.

MAKE YOUR OWN PLAYING CARD
Draw your own animal and a brief explanation of that animal from your study of this workbook.
An earthquake sends a shower of rocks and earth onto the glacier's surface from the mountains above. The dark material absorbs heat and causes glacial melting.  
**Go back 1 square.**

A tremendous volcanic eruption sends ash for hundreds of miles, covering the glacier's surface. The dark ash absorbs heat and causes glacial melting.  
**Go back 1 square.**

The summer has been extremely warm and sunny, causing much glacial melting.  
**Go back 1 square.**

The winter has brought a heavy snowfall. The glacier grows.  
**Go forward 1 square.**

You stop to photograph the beautiful blue of recently exposed glacial ice.  
**Lose 1 turn.**

You notice that lichen is growing on the rocks next to the glacier. You stop at three places to measure it so you can figure out how fast the glacier is retreating.  
**Lose 1 turn.**

The glacier surges at the dizzying rate of 1,000 feet a day.  
**Go forward 1 square.**

An earthquake shakes the area, causing huge ice bergs to calve from the glacier's face.  
**Go back 1 square.**

You ski down the glacier, making excellent time.  
**Go forward 1 square.**

As you travel down the glacier, you encounter a medial moraine where another glacier has joined this one. You turn uphill to investigate the other glacier.  
**Go back 1 square.**

As you traverse the glacier, you notice what look like small black threads moving on its surface. You stop to watch the ice worms.  
**Lose 1 turn.**

Meltwater has built up at the glacier's base, putting intense pressure on it. The glacier begins to surge forward.  
**Go forward 1 square.**

A comparison of photographs taken last year and this year shows that the glacier has advanced.  
**Take an extra turn.**

You descend into an ice cave to study the glacier, and find that the cave extends for many hundreds of feet toward the glacier's terminus.  
**Go forward 1 square.**

As you travel across the glacier the sun shines brightly and causes you to go temporarily snow blind.  
**Lose 1 turn.**

You are caught in a white-out as you travel down the glacier, and because you cannot see anything in the blowing snow, you must wait until the storm passes.  
**Lose 1 turn.**

An earthquake causes a huge rock face that is blocking the glacier to crack and break. The glacier moves quickly past the broken rock.  
**Go forward 1 square.**

Although the winter has been warmer than usual, it has also been very wet, adding much new snow to the glacier's base.  
**Go forward 1 square.**

You travel down the glacier by snow machine, making excellent time.  
**Take an extra turn.**

The glacier encounters little resistance as it moves over soft, sedimentary rock, so it advances quickly.  
**Go forward 1 square.**

The glacier reaches a steep slope and begins a rapid fall downward.  
**Go forward 1 square.**