National Park Service
U.S. Department of the Interior

Alaska Region

Our Wild Neighbors

An Educational Resource Book About Alaskan Animals

An Educational Resource provided by the Alaska National Park Service

Our Wild Neighbors

An Educational Resource Book about Alaskan Animals

Alaska has over 430 species of birds, the largest population of bald eagles in the nation, and the largest land mammal in the world (the brown bear; the polar bear is considered a marine mammal). From pygmy shrews that weigh much less than a penny to gray whales that weigh 16-45 tons, Alaska is the Last Frontier for animals as well as people. Species endangered elsewhere are abundant in Alaska.

And that's not all… Alaska has the longest salmon run in the world (2,000 miles up the Yukon), arctic terns that fly 24,000 miles from Antarctica and back, and caribouthat migrate 2,000 miles from Canada to their calving grounds in the Alaskan Arctic.

Although Alaska has an abundant variety of wildlife, the land itself is both harsh and fragile. It takes 100 square miles to support one grizzly bear living on the North Slope, and a willow in the Brooks Range may only have a trunk five inches in diameter although it is over 3,000 years old. Alaskan animals are incredibly interdependent with their environment and each other; some hang just a thread from extinction.

So who makes up the wildlife in Alaska? Let's check it out!

The Our Wild Neighbors Educational Resource Book is reinforced and complemented by the Our Wild Neighbors web site at **http://www.nps.gov/aplic/forkids.htm**

Meeting Alaska Content Standards

The *Our Wild Neighbors* workbook addresses the following Alaska Standards adopted by the Alaska State Board of Education:

Science A: A student should understand scientific facts, concepts, principles, and theories.

9) understand the transfers and transformations of matter and energy that link living things and their physical environment, from molecules to ecosystems (Flow of Matter and Energy);
12) distinguish the patterns of similarity and differences in the living world in order to understand the diversity of life and understand the theories that describe the importance of diversity for species and ecosystems (Diversity);
13) understand a) the interdependence between living things and their environments; b) that the living environment consists of individuals, populations, and communities; and c) that a small change in a portion of an environment may affect the entire environment (Interdependence);
15) use science to understand and describe the local environment (Local knowledge);

Science C: A student should understand the nature and history of science.

8) understand that acceptance of a new idea depends upon supporting evidence and that new ideas that conflict with beliefs or common sense are often resisted.

Science D: A student should be able to apply scientific knowledge and skills to make reasoned decisions about the use of science and scientific innovations.

1) apply scientific knowledge and skills to understand issues and everyday events;
3) recommend solutions to everyday problems by applying scientific knowledge and skills;
4) evaluate the scientific and social merits of solutions to everyday problems;
5) participate in reasoned discussions of public policy related to scientific innovations and proposed technological solutions to problems; and
6) act upon reasoned decisions and evaluate the effectiveness of the action.

Geography C: A student should understand the dynamic and interactive natural forces that shape the earth's environments.

1) analyze the operation of the earth's physical systems, including ecosystems, climate systems, erosion systems, the water cycle, and tectonics;
3) recognize the concepts used in studying environments and recognize the diversity and productivity of different regional environments.

Geography E: A student should understand and be able to evaluate how human and physical environments interact.

1) understand how resources have been developed and used;
2) recognize and assess local, regional, and global patterns of resource use;
4) determine the influence of human perceptions on resource utilization and the environment;
5) analyze the consequences of human modification of the environment and evaluate the changing landscape

Geography F: A student should be able to use geography to understand the world by interpreting the past, knowing the present, and preparing for the future.

3) analyze resource management practices to assess their impact on future environmental quality;
6) utilize geographic knowledge and skills to support interdisciplinary learning and build competencies required of citizens.

Government and Citizenship E: A student should have the knowledge and skills necessary to participate effectively as an informed and responsible citizen.

1) know the important characteristics of citizenship;
6) recognize the value of community service; and
7) implement ways of solving problems and resolving conflict.

Technology A: A student should be able to operate technology-based tools.

1) use a computer to enter and retrieve information;
2) use technological tools for learning, communications, and productivity.

Our Wild Neighbors

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Did you know?

Ten million swans, geese, and ducks nest in Alaska each year. Thatís ten times the population of people in Montana!

Only female mosquitoes bite. They use blood for egg production. (No, the mosquito is not the Alaska state bird.)

Iceworms really do exist! A small segmented black worm, less than an inch long, the iceworm lives in temperatures just below freezing. They can be found on the surface of glaciers at dawn, dusk, and on cloudy days.

Killer whales are the fastest marine mammals alive (over short distances). A killer whale can swim the distance of half a football field in THREE SECONDS!

In Alaska, caribou outnumber people. There are about 616,000 people living in Alaska and 900,000 caribou.

Penguins do not live in Alaska; they live in the Antarctic. Alaska has puffins and murres, both look a little like a penguin.

Alaska has NO reptiles (snakes or lizards) and NO rabbits (they are all hares). A rabbit is born without hair; hares are born with hair already. In Alaska, you need all the warmth you can get!

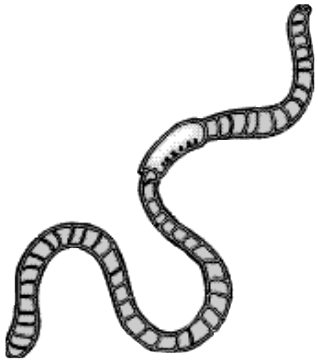
Raccoons are NOT native to Alaska, but have been introduced on Kodiak Island and parts of the Southeast.

Bears are cuddly only to their mothers. Bears are not like the teddy bear you grew up with!

Over 80 years ago, Theodore Roosevelt spotted a small cub while hunting. The President refused to kill the small creature. Cliff Berryman, a newspaper artist, drew a cartoon about the event in the Washington Post in 1902. A candy store owner in Brooklyn, New York saw the cartoon and started making stuffed toy bears. They got the President's permission to use the name "Teddy Bear". The store owner, Morris Michtom, later started the Ideal Toy Company.

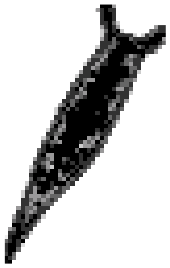
It's not just about mammals...

A study of Alaskan animals is more than just **mammals** (warm-blooded animals that are nourished by their mother's milk). Favorite Alaskan mammals might include caribou, moose, bears, wolves, fox, or mountain goat. These animals are **vertebrates** (animals with backbones) in the Kingdom Animalia.



Other important vertebrate members of the Kingdom Animalia include birds, fishes, and amphibians. **Invertebrates** (multicellular animals without backbones) in the Kingdom Animalia include crabs & spiders, clams & snails, worms, insects, starfish & urchins, and jellyfish. These animals play an important role in their environment. Many are food for other animals; others eat dead and dying plants and animals, making soil and releasing minerals in the process.

Outside the Kingdom Animalia is the plant kingdom (Kingdom Plantae). Plants are a basic element in the environment, converting energy from the sun into edible material by way of **photosynthesis**. Plants not only provide food, but they also provide shelter for animals and regulate our atmosphere in a continual exchange of carbon dioxide and oxygen. Plants range from trees to flowers to ferns and mosses.



The Kingdoms Fungi (molds & mushrooms), Protista (protozoa, plankton, & algae), and Monera (bacteria) also contribute to the cycle of life. They also provide food to animals, recycle dead materials, and, in the case of bacteria, help with digestion in humans!

If our environment did not have these small but important organisms, the cycle of energy and minerals would not be complete. So hurray for the small things!

Kid's Summary

Organisms like worms, insects, and mushrooms are important to the environment. Even organisms we can't see, like bacteria, serve a purpose. It's not just the big animals that are important.

What's in a Name…an Animal Taxonomy Refresher For Teachers Only!

Taxonomy is the science of grouping organisms on the basis of similarities. A Swedish botanist named Carolus Linnaeus suggested that organisms with similar characteristics be placed in the same taxonomic group and be called a "**species**". Two organisms of the same species will produce fertile offspring if bred. Today taxonomists study chromosomal and biochemical similarities to determine taxonomy. All Alaskan animals are in the Kingdom Animalia. Other Kingdoms include Plantae (plants), Fungi (mushrooms), Protista (algae and protozoa), and Monera (bacteria).

Invertebrates are animals without backbones. Man and his mammal friends have a backbone (and are called **vertebrates**), but many animals like worms, insects, and crabs do not have a backbone. A crab has its skeleton on the outside; the starfish has its protective bone structure just under a spiny skin. Other invertebrates include sponges, jellyfish, coral, worms, clams, and insects. Believe it or not, animals with spines are in the minority. Over 97% of the animal kingdom are invertebrates, animals without a backbone.

All the other Alaskan animals we will study are **vertebrates**:

- Salmon, grayling, halibut, and trout are all **fishes**.
- Frogs and toads are **amphibians**; they live both on land and water.
- **Reptiles** (snakes, lizards, turtles and alligators) do not have to return to the water to reproduce. There are no reptiles in Alaska. Note: there have been some tales of garter snakes in the Southeast and a green sea turtle who lost its way in the Pacific Ocean. These animals are exceptions to the rule.
- There are 430 species of **birds** in Alaska; they are different from other vertebrates in that they have feathers.
- Man is a **mammal**, a vertebrate nourished by its mother's milk.

  Types of mammals are **ungulates**, mammals with hooves like deer, caribou, moose, muskox, Dall sheep, and mountain goats. Most ungulates eat plants, live in herds, and defend themselves by running.

  Some mammals hunt other animals for food and are called **carnivores**. This group include wolves, fox, bears, wolverine, weasels, and otters, sea lions, seals, and walrus. They have sharp teeth and a keen sense of smell, vision, and hearing. They also have whiskers.

  Whales are **cetaceans**, marine mammals that have blubber and no hindlimbs. They breathe air and have flippers for their front "feet."

  Gnawing mammals or **rodents** are different from other mammals because of their teeth. All rodents have two pairs of large, curving incisors that grow constantly. There are more than 3,000 species of rodents, making it the largest order or group of mammals. Rodents have a specialized intestine for digesting plant material. Rodents include squirrels, porcupines, and beavers.

  Lagomorphs are rodent-like animals but are not rodents. Lagomorphs have an additional pair of teeth behind their upper incisors. Hares are lagomorphs.

  Man is a **primate**, distinguished by their highly developed brain. They nurture their young for a long time and have an opposable thumb and sophisticated vision.

Taxomony in a Nutshell…

Kingdom Monera:	Bacteria.
Kingdom Protista:	Algae and protozoa.
Kingdom Fungi:	Mushrooms and molds.
Kingdom Plantae:	Plants.
Kingdom Animalia:	
Invertebrates:	Crabs, clams, starfish, insects, worms, sponges, jellyfish, coral.
Vertebrates:	
Fishes:	Salmon, halibut, grayling, trout.
Amphibians:	Wood frog.
Reptiles:	None in Alaska. Otherwise, snakes and lizards.
Birds:	Canada goose, eagle, loon, ptarmigan, puffin, raven, tern, magpie.
Mammals:	Include egg-laying, pouched, and placental mammals.
Placental Mammals:	
Insect-Eating Mammals:	Moles.
Flying Mammals:	Bats.
Hoofed Mammals (Ungulates):	Caribou, deer, moose, muskox, Dall sheep, mountain goat.
Trunk-nosed Mammals:	Mastodons and mammoths. Now extinct in Alaska.
Carnivores:	Black bear, polar bear, brown bear, arctic fox, red fox, wolf, wolverine, porcupine, weasels, muskrat, seals, otters, walrus, and sea lion.
Aquatic Mammals:	Cetaceans - Beluga and humpback whales. Sea cows, dugongs and manatees. None in Alaska.
Rodents:	Beaver, porcupine.
Logomorphs:	Snowshoe hare.
Toothless Mammals:	None in Alaska. Tree sloths, armadillo, and anteaters.
Primates:	YOU! Also monkeys and apes.

This taxonomy chart is abbreviated for simplicity and does not use the formal names for the orders and phylums under the kingdoms.

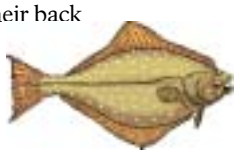
Although it is important to name animals, it is more important to know how their lives interact with their environment, other animals, and US!

Teacher Background: Alaskan Animals We Know and Love

Dungeness crabs are invertebrates; they do not have a backbone. Their skeleton is on the outside. They live in the ocean and eat worms, clams, crabs, starfish, fish parts, and algae. They are eaten by fish, other crabs, and otters. They protect themselves with their front claws. They molt their shells and even migrate to and from deeper water with the seasons. Crab is a major money-maker for Alaskan fisherman; only male crabs can be sold.

The **wood frog** is one of the only amphibians found in Alaska. (There is also a spotted frog and the western toad.) Wood frogs are found in grasslands, forest, muskeg, and even tundra. The frog is dark (to absorb heat from the sun) and about three inches long. These frogs hibernate in old vegetation during the winter. They eat insects and small animals and are eaten by birds and larger animals like mink and otter.

Pink (or humpback) salmon are only one of four types of salmon in Alaska. The other types include the red (sockeye), chinook, and chum. Female pink salmon release their eggs in rocky nests, where they are fertilized by the male salmon. After all 1,500-2,000 eggs are released, both salmon die. In the spring, newly hatched fry swim to the ocean to grow and return again to spawn. Salmon feed on insects, squid, and smaller fish and are eaten by larger fish, bears, eagles, seals, whales, and people. Adult males develop a large hump on their back before spawning.



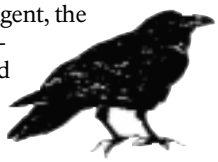
Halibut live in the deep waters, on the floor of the ocean. One of their eyes migrates to the topside of the fish. The topside of the halibut tends to be the color of the ocean bottom; the underside a lighter color. In this way, the halibut is camouflaged from predators. They are also very powerful swimmers. Halibut eat a variety of fish as well as crab and shrimp. Young halibut are eaten by larger fish and sea mammals. The sportsfishing record for halibut is 450 pounds.

Lesser Canada geese are the mos geese in Alaska. They nest in coast wetlands, coastal tundra, and rive valleys. They mate for life and are flightless for about a month each summer while they molt. Predators include fox, gulls, wolves, bears, wolverine, eagle, raven, and man.

Geese eat grasses, berries, and grains. Geese have overpopulated in protected areas of cities like Anchorage. Harvesting their eggs, leaving only one in each nest, may help reduce the population of geese in urban areas.

Bald eagles get their name from the white feathers on their head. These feathers do not grow until four to five years of age. They live along Alaska's coasts, lakes and riverways; they prefer the tallest trees in a stand. Their diet consists of fish, small mammals, waterfowl, crabs, urchins, and already dead animals. Young eagles are sometimes eaten by ravens and magpies. Eagles are considered threatened in the rest of the United States; they used to be endangered. It is illegal to possess any portion of an eagle, even a feather.

The **willow ptarmigan** is Alaska's state bird. Their wings are white all year, but their whole body turns white in the winter. Their feet are covered in feathers for insulation. They live in alpine and dry lowland tundra and migrate from one feeding place to the other in the winter. They can be seen gathering in flocks of several thousand, returning to their breeding grounds in the spring. They eat the buds and twigs of willow and other shrubs, seeds, berries, and some insects. They are eaten by fox, lynx, golden eagles, and humans.

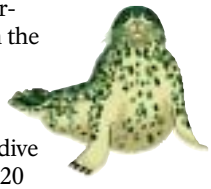


The **raven** is the largest songbird and all-black bird in the world. Considered highly intelligent, the raven has over 30 calls. They are long-lived (29 years for one in captivity) and mate for life. They are found in many habitats all over Alaska. They eat small mammals and birds, berries, eggs, and dead meat. Raven eggs may be eaten by crows, weasel, or jays. They cache their food and regurgitate unneeded food in the form of a pellet (like owls). They are protected under the Migratory Bird Treaty between the United States, Canada, and Mexico.

Common loons live in freshwater lakes all over Alaska. They mate for l and return to the same lake every ye They lay two eggs and the baby loor ride on their mother's back when ve young. They eat aquatic plants, fish, leeches, snails, frogs, and insects. They are eaten by fox, gulls, and eagles. Loons can dive up to 240 feet. Wake from motor boats can drown young chicks and fishing line can entangle adult and young birds.

The **horned puffin** is a seabird, coming to land only to breed. They have orange a red beaks and feet and are known as "sea parrots". They nest on cliffs or in burrows dug into steep hillsides. They lay only one egg which is nurtured by both parents. They eat fish and zooplankton. Puffin eggs are vulnerable to other birds and small animals. Puffins may abandon their nest if disturbed, so their colonies are protected by state and federal laws. They are also affected by oil pollution because they spend so much time at sea.

Harbor seals are warm-blooded, air-breathing marine mammals found in the coastal waters of Alaska. They "haul out" of water onto ice, shoals, buoys, and beaches to rest, give birth, or nurse their pups. They can dive to 600 feet and hold their breath for 20 minutes because of reduced heart rate and retention of oxygen by their muscles. They have a single pup that swims right after birth. They eat fish, octopus, and squid. Harbor seals live to be 26-32 years old. Fishermen sometimes accuse seals of robbing fish from their nets.



The **Sitka black-tailed deer** lives in the rainforests of Southeast Alaska. Old growth forests provide ideal habitat because the trees block out deep snow but still allow enough light for plants to grow. Deer have also been transplanted to Kodiak and the Prince William Sound. They are a small deer; only bucks have antlers. Heavy snowfall leads to starvation and takes a toll on deer populations. Unlike caribou, deer migrate only one-half to five miles. They eat plants and the green leaves of shrubs. In winter they browse on bunchberry, blueberry, cedar, hemlock, and woody plants. Deer are prey to wolves and bear. Clear-cut logging has had a dramatic effect on the decline of deer populations.

The **wolf** lives over 85% of Alaska in a wide variety of habitats. They range in color from black to almost white. They are highly social animals, living in packs with an alpha male and an alpha female. Wolves build dens in the side of hills and have four to seven pups. The range of a pack can be 200-600 square miles. Wolves eat moose, caribou, Dall sheep, deer, mountain goats, beaver, hares, rodents, and sometimes fish and birds. They are occasionally eaten by other wolves. Wolves are an important variable in keeping animals populations in check. For this same reason, wolves are sometimes blamed for low populations of game animals humans love to hunt.

The **red fox** is found throughout Alaska. They are related to wolves, both being members of the dog family. They always have a white tip on their tail, but can range in color from red to silver to black. Like wolves, fox build dens in which to have their kits. Fox eat rodents, hares, squirrels, birds, eggs, insects, plants, and dead meat. They cache (or store) their food for later use. Fox predators include wolves, coyotes, lynx, wolverine, and eagles. They are subject to rabies which can kill large numbers of animals and also infect man. They can be quite tame in areas where contact with humans is common.

The **beaver** is North America's largest rodent. It is found in forested areas all over the state. It has large webbed feet and a broad, flat tail used for swimming and balance when cutting down trees. Beaver slap their tail on the surface of the water as a warning signal to other beaver. Beaver have ear and nose valves that close when the animal is underwater. Beaver require two to three feet of water all year round for transporting food and hiding from predators. To ensure this level of water, beaver sometimes construct dams. Beaver lodges and dens are used as food caches. They are a single room with multiple exits for food access and escape. Beaver eat bark, aquatic plants, roots, and grasses. Beaver are eaten by wolves, lynx, wolverine, bears, and man. Beaver- made ponds create new habitat for ducks and fish although at times they also flood trails and campgrounds.

The **sea otter** is a relative to mink and land otter and lives throughout the coastal waters of Alaska. Its hind feet are webbed and its fur is very dense. The otter relies on trapped air in its fur for insulation in the cold water. They are good swimmers and divers, holding their breath for four minutes. They eat clams, urchins, crab, fish, and octopi. They have one pup in late spring which may hitch a ride on its mother's chest. Otters are adept with their front paws, cracking clams with a rock. In the wild, otters never eat on land. Predators include eagles and killer whales.

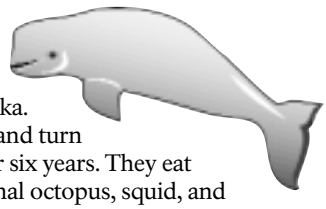
The **porcupine** is the second largest rodent in Alaska. It is entirely covered with barbed quills (except for its belly, footpads, and nose). A newborn porcupine is born with hair that within hours develops into quills for protection against weather and enemies. Porcupine have poor eyesight, but a keen sense of smell. They eat the inner bark of spruce, hemlock, and birch. In the spring they eat a variety of buds and leaves. They have a taste for salt from perspiration left on ax handles, canoe paddles, or leather. They also eat antlers and bones of dead animals to obtain calcium and phosphorus. Porcupines are a favorite meal for wolves, coyotes, lynx, and wolverines. Native Alaskans use porcupine quills for decoration and jewelry.

The **snowshoe hare** is found in forests, swamps, and brush throughout interior and southcentral Alaska and are an important part of the food web. They differ from rabbits in that they are born with fur and with eyes open, not hairless and blind. Their coat turns white in the winter and their hind feet are well-furred like snowshoes. They eat grasses, buds, twigs, and leaves in the summer and spruce twigs and needles, birch and willow bark in the winter. They are eaten by owls, lynx, fox and coyote. They do not live underground, but use natural shelters under bushes and branches. Hare populations follow high and low cycles.

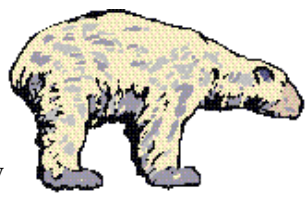
The **red squirrel** can be found in spruce forests over most of Alaska. Much of the squirrel's summer is spent cutting and storing green spruce cones. A single cache may be three feet deep and 15-18 feet wide. They also store mushrooms on tree branches. They eat seeds, berries, insects, and eggs. They are eaten by hawks, owls, marten, and housecats. They will nest in multiple sites, in a hole in a tree or in a mass of twigs, leaves, and lichen. A red squirrel's territory is about an acre. They remain active all year and help scatter seeds to other areas.

Walrus are found in relatively shallow water near ice or land. Both males and females have elongated canine teeth called tusks. The tusks are used for fighting and climbing. They have bristly moustaches and males can weigh up to two tons. They migrate north in the spring, following the breakup of the pack ice. Walrus feed on clams, snails, crabs, worms, and sometimes seals. Eskimos hunt walrus for food and clothing.

Gray whales migrate between California and Alaska every year. That's a 10,000 mile journey! Newborn calves are 16 feet and 1500 pounds. Gray whales are bottom -feeders, laying on their sides and filtering crustaceans through their hairy baleen plates. Their only predators are killer whales and man. Many gray whales have scars from past battles with killer whales. In the 1800's and 1900's, gray whales were hunted almost to extinction (only a few hundred to a few thousand were left). The International Convention for the Regulation of Whaling in 1946 protected the whales so that they now number 16,000 to 20,000.



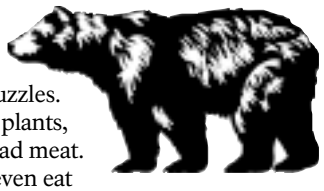
The **Beluga whale** is a toothed whale (not a baleen whale) found in the coastal waters of Alaska. They are born dark gray and turn white by the age of five or six years. They eat mainly fish, with occasional octopus, squid, and clams. They are eaten by polar bears and killer whales. Beluga travel in groups of up to 1,000 animals. They are very social with many vocalizations. Beluga have been known to migrate up freshwater rivers. Eskimos harvest beluga for muktuk (the outside blubber) and for oil for fuel.



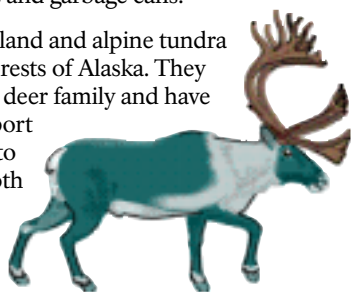
The **polar bear** is a marine mammal, living most of its life in the water. Polar bears live near the ice pack, migrating with it in the spring and fall. Adaptations include hollow hair for swimming, a white coat, and hairy feet. Female bears build a den in drifting snow and give birth to two cubs in December. They don't emerge from the den until late March or April. Polar bears eat ringed seals, walrus, and beluga whales. They are also scavengers, eating dead meat. Polar bears can only be hunted by eskimos. Oil exploration and drilling is of concern to these bear's habitat. Disturbing denning areas and oil spills could affect the population.

Brown bear live throughout Alaska except for the far western islands of the Aleutian chain. They have a dish-shaped face and a hump on their back above the shoulder. Bears are born in a winter den, without hair and weighing less than a pound. Young bears stay with their mothers for three to five years. Brown bear eat many types of food including salmon, berries, grasses, roots, and cow parsnip. Bears will also eat moose and caribou as well as dead meat. Bears are dormant during the winter. Seventy percent of all North American brown bears live in Alaska.

Black bear live in the forested areas of Alaska. Black bears all have brown pointed muzzles. They eat moose calves, plants, salmon, berries, and dead meat. Sometimes a bear will even eat another bear. Black bear go into dormancy (not hibernation) in the winter, waking up periodically to hunt for food. Bears have been known to break into cabins and garbage cans.



Caribou live in lowland and alpine tundra and the northern forests of Alaska. They are members of the deer family and have split hooves to support them on snow and to help them swim. Both males and females have antlers that they shed each year. Newborn caribou can outrun a man a few days after birth and swim across lakes and rivers. Caribou eat a variety of plants, mostly willows, birch, and grasses, switching to lichens (reindeer moss) in the winter. They continually migrate to different areas for food. They are eaten by wolves, bears, wolverine, and people. Native Alaskans hunt caribou for food and clothing. Domesticated caribou are called reindeer.



The **moose** is the largest member of the deer family. Moose thrive in forests and river thickets. Only bulls have antlers for use in courtship displays. Young are born as twins, leaving their mother after a year. They eat willow, birch, aspen, pond weeds, and grasses. They are eaten by wolves and bears. Moose only migrate a few to 60 miles. Deep snow can lead to malnutrition of hundreds of moose. Moose were hunted by Native Alaskans and early explorers as an important source of food. Moose live in urban areas and may eat fruit trees and gardens. Many moose are killed by automobiles and trains.

Dall sheep live on open alpine ridges and meadows. Male sheep have large curly horns; female sheep have smaller, only slightly curved horns. A sheep's age can be found by counting the rings on his horns. It takes seven or eight years for a ram's horns to make full circle. Dall sheep eat grasses and sedges. In the winter, sheep may eat willow, lichen, and moss. Most sheep populations will visit mineral licks in the spring. They are eaten by wolves, wolverines, bears, coyotes, and eagles. Sheep can easily catch diseases from domestic livestock.

Mountain goat live in rugged mountain country. The have longer hair than Dall shee a beard, and black horns. Both males and females have horns. Goats graze on grasses and shrubs in the summer meadows and hemlock and other browse in the winter. Predators are wolves, coyotes, bears, and eagles. Mothers and kids form nursery flocks. Many goats have missing teeth and scars, probably from falls.

Muskox are related to sheep and goats. They have changed little since the Ice Age and are well adapted to living on the Arctic tundra. Muskox have long hair with fine underhair. This soft underfur called qiviut is gathered and knitted into scarves and other garments. Both male and female have horns. They are very social animals, living in harems with a dominant male. Males prove dominance by clashing horns at high speeds. They protect their young by forming a line or circle with their horns outward toward the threat. The muskox' main predator is the wolf. Muskoxen eat a variety of grasses and woody plants. They are eaten by wolves and humans. They seek out areas blown free of snow in the winter.

Introducing our wild neighbors...

Activity 1

Our Wild Neighbors Bingo

Use activity sheets a through e on pages 9-13.

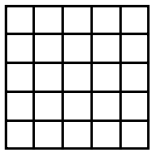
Duration: 30-45 minutes

Learning Objective:
Students identify major species of Alaskan animals.

Method:
Students make a customized bingo card of Alaskan animals and then play a bingo game by identifying the animals. This activity can act as a pretest or an introduction to Alaskan animals.

Materials:
15" squares of cardboard or tagboard marked with a grid of 3" squares. Alaskan Animal Activity cards, one set for each student in the class plus an extra set. Gluesticks. Beans or poker chips for bingo markers.

Procedure:
Remove five animal cards at random from each set before distributing to the students, but make sure all animals are represented in the classroom. Ask the children to cut out the cards and position them on their desks within easy reach. The students will each have 25 animal pieces.



Name an animal and have the students choose the animal from their pile and glue it anywhere on their bingo card. Introduce the animal with a few facts from the background materials and help those children who do not know what the animal looks like. Proceed with all 30 animals until the bingo cards are completed.

Draw the extra set of activity cards one at a time from a jar and play Our Wild Neighbors bingo. The first student to complete a horizontal, vertical, or diagonal line wins the game, or continue until all cards have had bingo.

Activity 2

Alaska Animal Magazine Montage

Duration: 30-45 minutes

Learning Objective:
Students demonstrate recognition of the major species of Alaskan animals. This activity familiarizes students with Alaskan animals using pictures and photographs.

Method:
Students identify Alaskan animals from magazines and make a montage.

Materials:
A large piece of posterboard or butcher paper. Old copies of Alaskan magazines that have pictures of Alaskan animals. Scissors, glue.

Procedure:
Ask the children to cut out pictures of Alaskan animals from magazines. Arrange and glue the pictures on the posterboard, and have the students label the animals. Display the montage in the classroom or the hall. Refer to the display in later discussion of Alaskan animals.

Vocabulary

species a category of animals with similar characteristics that are able to successfully interbreed

mammal a class of animals with self- regulating body temperature, hair, and lactation glands on the females

reptile a cold- blooded vertebrate having an outer covering of scales or horny plates, that breathes with lungs

vertebrate having a backbone

invertebrate lacking a backbone or spinal column

photosynthesis the process by which chlorophyll in green plants converts light to chemical energy and makes organic compounds from inorganic compounds

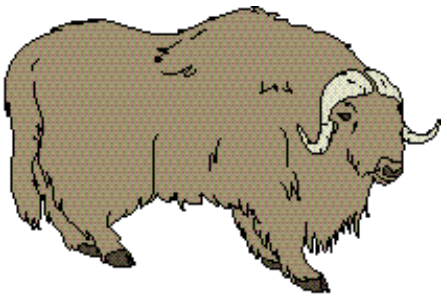
Black Bear

Dall Sheep

Caribou

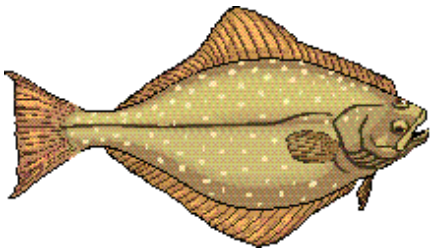
Mountain Goat

Moose



Musk Ox

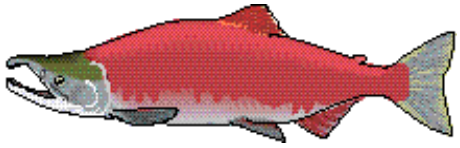
King Crab



Halibut

Wood Frog

Lesser
Canada Goose



Sockeye Salmon

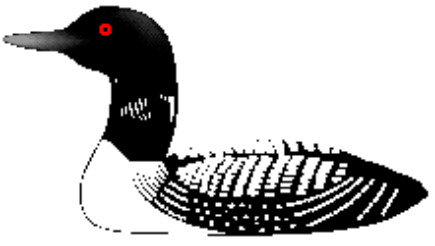
Bald Eagle

Ptarmigan

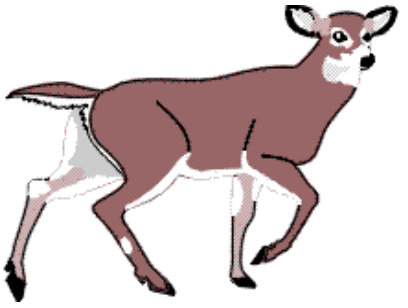
Horned Puffin

Raven

Harbor Seal



Common Loon



Sitka
Black-tailed Deer

Wolf

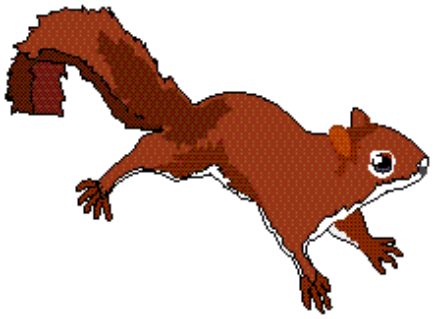
Sea Otter

Red Fox

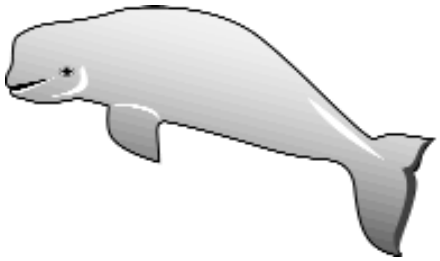
Porcupine

Beaver

Snowshoe Hare

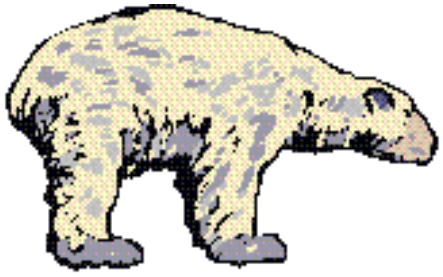


Red Squirrel

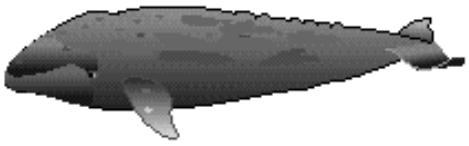


Beluga Whale

Walrus



Polar Bear



Gray Whale

Brown bear

Activity 3

Our Wild Neighbors Memory Game

Use activity sheets a through e on pages 9-13, or sheet g on page 16.

Duration: 30-45 minutes

Learning Objective:
Students demonstrate their knowledge of the names and physical appearance of some of the major species of Alaskan animals.

Method:
Using the Alaskan Animal Activity cards, students in small groups play a memory game on the placement of the cards.

Materials:
Ten or twelve copies of the Alaskan Animal Activity cards on heavy paper, already cut out. Each small group will need two copies of the cards.

Procedure:
Children may already be familiar with the game Memory or Concentration. Students love to test their memory.

Have each group of children lay out the cards in rows (10 x 12 works well), face-side down.

The object of the game is to make as many matches as possible. Each student turns over two cards, trying to remember where each animal is located in the grid of cards. All students should watch the board carefully, to see what animals are revealed at each turn. After a successful match is made, the student keeps the pair to tally at the end of the game. If no match is made, the cards are turned back to face down. A student continues to play with each successful match. The winner of the game is the student with the most matches.

As a summary, put the animal cards on overheads and test the classes knowledge of each animal. Ask for a few facts about each animal.

Activity 4

Alaskan Animals Passport Book

Use activity sheets f and g on page 15 and 16.

Duration: 30-45 minutes

Learning Objective:
Students personalize their study of Alaskan animals.

Method:
Students make an Alaskan Animals passport book, pasting and labeling the Alaskan animals they have seen (or want to see) into the book.

Materials:
Heavier dark blue paper, the passport signature page, and white paper pre-cut to passport size. Multiple copies of Alaskan Animal Activity cards distributed to groups of four or five students.

Procedure:
Children in Alaska may see numerous animals in their neighborhood or on weekend and holiday trips with parents. Even children living in urban settings may see moose, squirrel, beaver, or porcupine.

Students construct a passport book by stapling the signature section and additional sheets on top of the blue section to form a passport. Students sign the first page of their passport book, including their name, address, and the date.

Students choose the animals to be pasted in their Alaskan Animals passport book. The teacher may want to divide the passport into sections for animals seen in the wild, animals seen at the zoo, and animals students want to see.

Students share their passport book with the rest of the class. The teacher might ask students to share stories of where they have seen some of the animals.

Extension:
Teachers may buy stamps of the more common animals to be stamped in the passport book.

ALASKAN ANIMALS PASSPORT

State of Alaska

This is an official record of the animals I have seen…or would like to see!

Signed _____

Date: _____

Name _____

Address _____

_____

_____

Years in Alaska _____

 Wolf	 Sea Otter	 Red Squirrel	 Beluga Whale	 Ptarmigan
 Red Fox	 Porcupine	 Walrus	 Polar Bear	 Raven
 Beaver	 Snowshoe Hare	 Gray Whale	 Brown bear	 Common Loon
 Black Bear	 Dall Sheep	 King Crab	 Halibut	 Horned Puffin
 Caribou	 Mountain Goat	 Wood Frog	 Lesser Canada Goose	 Harbor Seal
 Moose	 Musk Ox	 Sockeye Salmon	 Bald Eagle	 Sitka Black-tailed Deer

Animals in Our Lives…

Animals are everywhere!

The bald eagle appears on quarters, dollar bills, the presidential symbol, and the top of flagpoles.

Car makers name their cars after animals:

Mercury Cougar	Ford Mustang	Ford Falcon
American Eagle	Dodge Ram	Volkswagon Rabbit

People use animals in sayings:

"crazy as a loon"	"loose as a goose"	"wily as a fox"
"blind as a bat"	"swims like a fish"	"eats like a bird"

Schools and professional sports use animals as symbols for teams. Can you name some?

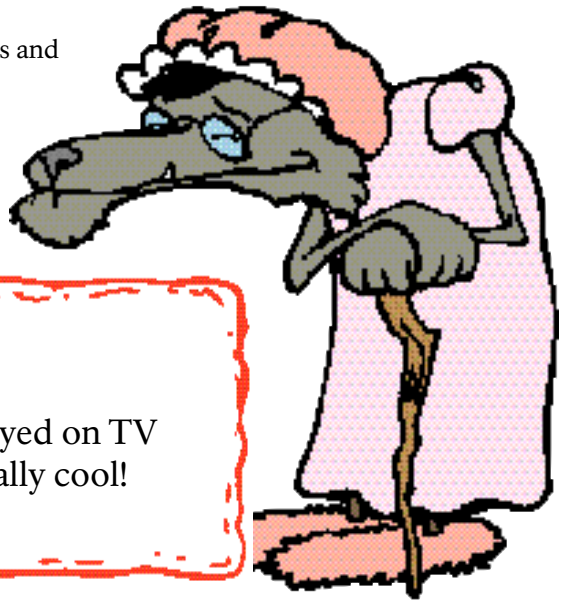
Wild animals are portrayed in stories, cartoons, and movies.

Wily Coyote	Grizzly Adams	Goldilocks and the Three Bears
Charlotte's Web	Winnie the Pooh	The Three Little Pigs (and the Big Bad Wolf)
Donald Duck	Mickey Mouse	

From the earliest times, animals have always been important to humans. Some of the first cave drawings were of animals. It is important to realize that animals as portrayed in movies, sayings, symbol, and cartoons may or may not be realistic. Sometimes animals are portrayed as too tame and sometimes too ferocious.

In reality, animals are wild creatures, with habits and behavior all their own. It is important to observe wild animals and see how they behave in nature. Do animals speak English? Do animals wear clothes? Do mice and coyotes walk on their hind legs? Are bats really blind?
Are loons crazy?

Even though animals do not appear as they do in movies and cartoons, they are still fascinating to observe and photograph (at a distance, of course). You may find you are learning a new language and set of behaviors of a totally different culture (the animal kingdom)!



Kid's Summary

Animals may not be like they are portrayed on TV or in the movies…but they are still really cool!

Adaptation…Changing to Survive

Alaskan animals **adapt** or change in many ways in order to survive better in their environment. Here are a few of the behavioral and physical **adaptations** specific to Alaskan animals.

Physical Adaptations

Fur, feathers and fat: Many animals have two coats, one of coarser water- repellent feathers or guard hairs. Their inner coat is made of softer feathers or hair that trap the air and help insulate the animal. Ptarmigan even have hair over their feet to protect them from the harsh winter. Caribou, muskox, and polar bear have hollow hairs that trap air for insulation and help with swimming, too. Seals have a thick layer of blubber to insulate them from the cold Alaskan seas. The feathers of birds are hollow so that they can fly.

Body shape: Northern animals tend to have smaller appendages than their southern counterparts. Fox, hare, and rodents in Alaska have shorter ears, legs, and tails to reduce heat loss. Caribou have split hooves that act like snowshoes on ice and snow. Long legs allow moose and caribou to make quick turns in the snow to escape predators. Birds' beaks and feet are perhaps the best example of adaptation to their environment. The thick beak of a nuthatch is for crushing seeds; the pointed beak of the woodpecker is for pulling insects from beneath the bark of trees. The wide toes of sandpipers keep the bird on high ground even in the mud; the webbed feet of waterfowl certainly help with swimming.

Camouflage: Hare, ptarmigan, and arctic fox turn white in the winter so that they may more easily hide from their predators. Likewise, in the spring, they begin to turn a brown to better match their surroundings. Young deer are speckled in color to blend in with the shadow- and- sun colors of the forest floor.

Protection: Many animals have special adaptations for protecting themselves and their young. Deer, moose, and caribou use their antlers as a last resort to ward off predators. Porcupines have quills that protect them. Crabs have a hard outer body covering for protection.

Behavioral Adaptations

Hibernation or dormancy: During the six to seven months of winter, brown bears become dormant. Their heart rate slows from 50-60 beats per minute to 20 beats per minute, but their body temperature is not lowered. Wood frogs can survive to temperatures of 21 degrees Fahrenheit because they have a type of "antifreeze" in their blood.

Cacheing: Many rodents store food for the winter. Squirrels store spruce cones and mushrooms; beaver store branches for winter snacks. Moose and bear store fat in their bodies for the long winter.

Migration: Many animals migrate to milder climates during the winter. Caribou, fish, and many birds migrate thousands of miles. Moose and mountain goats are local migrators, moving to lower altitudes in the same area.

Shelter: Many rodents live under the snow; ptarmigan sleep under the snow. Temperatures under seven inches of snow can be as much as 50 degrees warmer than at the surface. Brown bears and wolves build their dens in the insulated earth on south -facing slopes.

Protection: Animals not only have physical adaptations for protection, but also behavioral. Young hare may freeze in place to avoid being spotted by a predator looking for movement. Muskox form a line or a circle around their young, with horns facing out, when threatened. Deer, moose, and caribou rely on running to escape predators. Some birds will fake an injury to lure danger away from their young; others (magpies and seagulls) will dive bomb and heckle possible threats.

Activity 5

Create a Creature

Use activity sheet h on page 20.

Duration: 30-45 minutes

Learning Objective:
Students apply their knowledge of adaptations to build a fictional creature. Students learn to infer actions and behavior from physical attributes.

Method:
Students use features from the Adaptations page to create their very own creature.

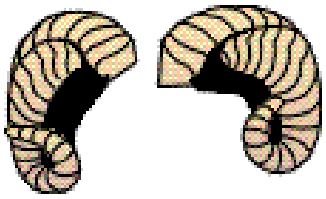
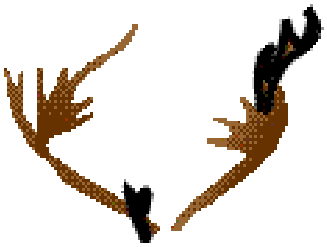
Materials:
Copies of the Adaptations page, one for each student, a background page for pasting the adaptation features, scissors for each student, and glue.

Procedure:
The teacher discusses adaptations with the class. Each student is given an Adaptation page, background page, scissors, and glue.

Have the students create a creature by cutting out and arranging different animal parts. Have the students think about how their creature might use each adaptation. Students may name their creations. Share the results by having each student present their creature to the class.

Extension:
Make this activity a three-dimensional one by using pipecleaners, styrofoam balls, feathers, clothes pins, toothpicks, and other household items to build a creature.

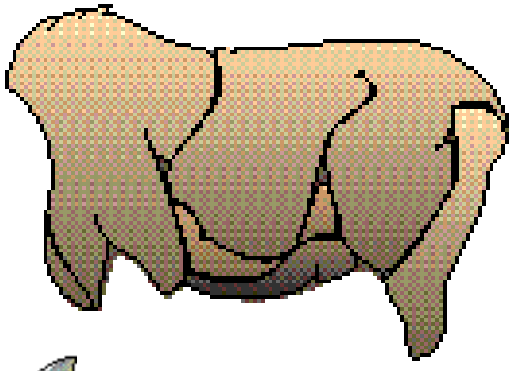
Animal Adaptations

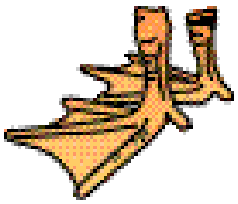



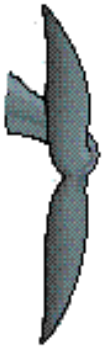












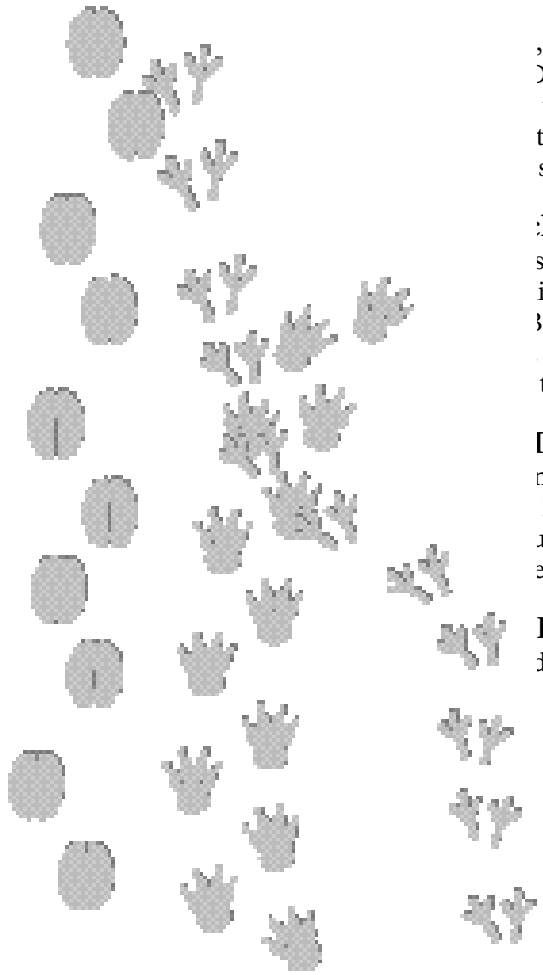
If You Don't See Them…Animal Evidence

There are many ways to tell if an animal lives in or travels through an area. Here are some common signs of Alaskan animals.

Nests: Many animals build nests. Birds, waterfowl, and squirrels all raise their young in a nest. The nest may be built of moss, grass and feathers. Eagles build large nests of sticks in the highest trees along rivers and other bodies of water. Woodpeckers nest in holes in trees; swallows will nest in holes in utility poles.

Burrows: Many animals live underground. Fox, wolf, rodents, and beaver all build underground homes. Beavers build large dams of small trees and branches. The puffin digs a burrow two or three feet into the ground for its eggs.

Depressions, Tunnels or Trails: Rodents create an elaborate network of tunnels in the snow during the winter. Hare and deer create trails in the snow that are used over and over again. Deer, moose, and many other animals leave paths in the tall grass. Moose, deer, and bear bed down at night and will leave a large depression of crushed grass.



, porcupine, and deer eat the bark of trees and shrubs, During periods of deep snow the bark will be stripped the moose or deer are standing on five to six feet of ts will leave 45 degree angle cuts on small willows and sharp incisors.

:hes: Squirrels leave cone caches in their territory and shrooms in the crooks of tree branches. The bones of imals can be found at the base of trees that are home to Bears will leave carcasses of moose or deer to retrieve at a (Always give a bear's meal a wide berth…bears are very their food!)

Teeth Marks: Moose rub on trees during their "rut" or n. Bears will also scratch tree trunks or other objects. leave "girdled" trees as evidence to their industry. upines may chew on leather or ax handles for the salt ey contain.

Droppings: Animal feces, known as skat, is also distinctive. Hare leave small flattened pellets of dried plant material. Goose skat resembles skinny cigars. Wolf and fox skat usually contains the bones and hair of the small animals they eat. Bear skat is larger plods of mixed vegetation and berries, with occasional fur and bones of animals. Moose droppings change from one season to the next. In the winter, moose drop nuggets that look like sawdust; in the summer, the skat changes to a pie of more succulent vegetation.

Hair and Antlers: Many animals leave bits of fur on trees and other objects as they pass by an area. Moose hair is long and straight. Caribou, moose, and deer all shed their antlers at various times in the fall and winter. Moose antlers are wide and heavy. Caribou antlers are thinner and more delicate. Deer antlers are not as big and often sport six sharp points.

Activity 6
Wildlife Detectives

Use activity sheets i and j on pages 23 and 24.

Duration: 30 minutes

Learning Objective:
Students identify the evidence of specific animals. Students learn to infer actions and behavior from the evidence observed.

Method:
Students use the Wildlife Detectives page to match up animals with the evidence they left.

Materials:
Copies of the Wildlife Detectives page, Alaska animals paste-on pictures, scissors, glue.

Procedure:
Each student is given a Wildlife Detectives page and an Alaskan animals paste-on pictures page.

Have the students cut out, arrange and glue the animals near the appropriate evidence on the Wildlife Detectives page.

Share the results with the class and discuss how there can sometimes be multiple answers (Fox and wolves also use dens). See answer sheet for assistance.

Extension:
Have students bring in examples of animal evidence…a log chewed by a beaver, moose nuggets, a piece of browse.

Noise: Many animals can be identified by the noise they make. Many birds have a very specific call. Squirrels are very vocal in defending their territory. Woodpeckers rap on wood in their quest for insects living under the bark of trees. Wolves howl to each other. Sometimes animals can be heard stomping through the underbrush or flying away as they exit an area.

Tracks: Most evident in snow, after a rain, and along river banks, tracks can tell a story about the animals in the area. A hare's back paws land in front of its front paws when it is running. Most animals will leave tracks, even if they are made by their tails or wings.

Kid's Summary

Even though you may not see an animal, look for evidence that it was there. Be a wildlife detective!

Vocabulary

browse	young twigs, leaves, and other plant material that animals have eaten
cache	to hide food to be eaten later
rut	a period of reproductive activity in male animals
feces	excrement.
burrow	a hole or tunnel dug in the ground by a small animal
carcass	the dead body of an animal
girdled	to remove a band of bark completely from around a tree
scat	animal droppings

stick nest
underground den
willow browse
stick lodge
worn trail
spruce cone pile
Wildlife Detectives

Red Squirrel

Moose

Black Bear

Beaver

Bald Eagle

Snowshoe Hare

Wildlife Detectives Answers

Bald eagles build huge stick nests in the very tops of trees. Often there are the bones of small animals on the ground underneath the nest. Eagles return to their nests year after year, so the nest can become ten feet across with each year's addition of sticks. Ravens also build stick nests, but they are much smaller.

Black bear and brown bear burrow into natural mounds of earth, sometimes near uprooted trees or in the side of small ravines. Fox and wolves also build dens for warmth and protection.

Beaver build lodges with multiple exits for access and escape. Beaver also build dams that back up streams. These rodents need two to three feet of water all year around to transport their food and hide from predators.

Snowshoe hare create well-marked trails that they use over and over again. Deer also create trails in the area in which they live.

Red squirrels chew into spruce cones, looking for the two seeds at the end of each scale on the cone. In the process, they create piles of spruce cone scales called **middens**. These piles can grow to be three feet deep and 15 to 18 feet wide.

One of the mainstays of a moose's diet is willow and alder browse. In the winter, moose also strip the bark of trees high above the ground, when they are standing on five or six feet of snow. Moose eat fruit trees and gardens in urban areas. Rabbits and porcupines also browse on willows and other trees.

Where Animals Live…Big Words, Big Thoughts

Each Alaskan animal lives in a specific environment with a specific way of life. This environment is called "**habitat**." Habitat provides food, water, shelter, and space so that animals can live.

- *The habitat for bald eagles is along Alaska's coast, lakes, and riverways where they can catch fish and nest in high trees.*
- *Moose habitat is forest and thickets. They especially thrive in newly burned areas where there is plenty of new willow browse.*
- *Sitka black-tailed deer live in forested areas, preferring old growth that shields them from deep snowfalls.*
- *Walrus habitat is relatively shallow water near ice or land.*
- *Sea otters live in coastal waters where there is a source of clams and other seafood.*
- *Mountain goat habitat is steep hillsides and cliffs of alpine tundra. In times of danger the goats climb to the more rugged rocks for protection.*

Habitats are part of even bigger systems called ecosystems. "An **ecosystem** is a physically distinct, self- supporting unit of interacting organisms and their surrounding environment." An ecosystem is made of living and non-living things. Non-living components include topography, moisture, temperature, and soil. Living components include the plants and animals that exist in the area. An ecosystem is a unit in which energy and nutrients flow between the living and non-living environment.

> *A forest is an ecosystem composed of trees. It is self- supporting because the trees change energy from the sun into chemical energy (stored in plant material). Animals eat the plants and are eaten by other animals, thus exchanging energy. When animals and plants die, they are decomposed by microorganisms that live in the forest soil, and the chemicals that are released are used by other living things. So a forest ecosystem sustains itself year by year in a continuous exchange of energy.*

An ecosystem is made up of many cycles. Water, carbon, oxygen, and phosphorus are cycled through an ecosystem. Energy is also an important cycle. Plants capture energy from the sun through photosynthesis. Animals capture this energy by eating plants. Other animals eat these animals and the cycle continues. When animals die, microscopic decomposers obtain the last bits of energy in the cycle, creating nutrients for plants to grow and continuing the cycle once again. A portion of the energy cycle is a **food web**, a description of which animals eat other animals.(A **food chain** describes only one pathway in a food web. A food web explores all combinations.)

Ecosystems in Alaska include:

desert - Yes, there is desert in Alaska.
grasslands
rainforest - forests with rainfall more than 80 inches.
oceans
tundra - windy, treeless, periodically cold environment at high latitudes and elevations.
coastal forests - dominated by Sitka spruce or hemlock.
boreal forests or taiga - spruce mixed with birch, aspen & poplar.
freshwater streams
riparian zones - land adjacent to aquatic ecosystems.
wetlands - riverlands, swamps, wet meadows, marshes, tidal lands, and bogs.

Kid's Summary

Habitats are where animals live. Ecosystems are usually bigger systems of plants, animals, land, and climate. Ecosystems recycle energy and minerals.

To make it simpler, there are four major ecosystems in Alaska: **oceans**, **forests**, **wetlands**, and **tundra**.

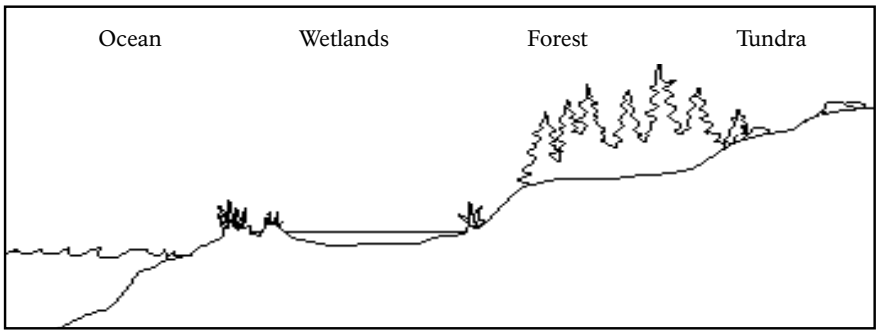
Illustrations adapted from the Alaska Wildlife Curriculum, ADF&G

Activity 7
Alaskan Ecosystem Mural

Use activity sheets a through e on pages 9-13.

Duration:
30-45 minutes

Learning Objective:
Students recognize the major types of ecosystems in Alaska and identify which animals live in each ecosystem.



Method:
Students make a mural containing the major ecosystems found in Alaska.

Materials:
10 feet of butcher paper, felt pens, crayons. Multiple copies of the Alaskan Animal Activity cards distributed to groups of 4-5 students.

Procedure:
Discuss what an ecosystem is and the four major ecosystems in Alaska: wetlands, forest, tundra, and oceans. It is hard to talk about animals without talking about plants and topography at the same time; discuss what trees and plants might live in each ecosystem.

Wetlands: Rivers, lakes, lagoons, marshes, and other water saturated areas. Vegetation includes willows, sedges, mosses, pond weeds, blueberries and cranberries.

Forests: Coastal rainforests are thick with Sitka spruce, cedar and hemlock. The Interior's boreal forests have white and black spruce. Both forests are home for cottonwood, alder, and willow.

Tundra: Treeless areas with low precipitation, permafrost, wind and vegetation like lichens, mosses, low-growing flowers and stunted shrubs.

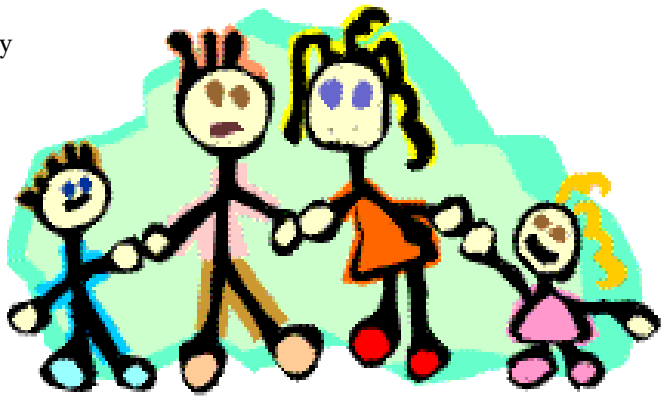
Oceans: Alaska's oceans are an environment of seaweed, kelp and algae.

Have the students draw the details of the ecosystems on a large piece of butcher paper. It is helpful if the teacher draws a basic outline of the ecosystems (see the drawing above). Have the students paste the Alaskan Animal Activity cards into the correct ecosystems on the mural.

Vocabulary

habitat	the environment in which an organism or biological population lives and grows
ecosystem	a physically distinct, self- supporting unit of interacting organisms and their surrounding environment
food chain	a chain of organisms in which food energy is transferred from one organism to another as each member consumes a lower member
food web	a complex of interrelated food chains
decomposer	an organism involved in the decay of other organisms

We're All in This Together



The components of an ecosystem are incredibly **interdependent**. Animals are linked to other animals and plants as well as to their physical environment. Each part of the system continually affects the other and a slight change in one can affect the entire system.

- *Unusually high snowfall can interfere with the feeding patterns of moose, leading to starvation. Fewer moose leave wolves and bears without a major food source.*
- *In the early 1900's, fox were introduced to the Pribolof and Aleutian islands. The fox quickly decimated the Aleutian Canada goose population by eating the eggs of these ground-nesting birds. The Aleutian Canada goose is now on the endangered species list.*
- *The Exxon Valdez oil spill occurred on May 24, 1989. Entire food chains were poisoned, from plankton to fish to seabirds to sea otters to orca whales to eagles and bears. (It is important to note that runoff from driveways and parking lots is the biggest contributor to marine pollution, even bigger than oil spills!)*

Biodiversity is the variety and abundance of organisms in an ecosystem. Biodiversity means genetic diversity—each species is different from other species. Each species plays an important role in an ecosystem. Ecosystems control climate and recycle nutrients.

- *A housefly's offspring, unchecked by predators, would cover the country of Germany to a depth of 47 feet in nine months.*
- *In the 1840's, a potato blight in Ireland led to the starvation of two million people and prompted a major emigration to the United States. The potato was later bred with wild potatoes that were more resistant to disease.*

Kid's Summary

Biodiversity means different kinds of plants and animals. Differences mean the continued health of ecosystems.

Different plants and animals also supply food, medicine, and industrial products to man. Corn, wheat, and rice were all once wild; now they supply two-thirds of the world's grain harvest. Commercial fishing (mostly wild stock) is a $75 billion -a- year industry. Almost a quarter of the prescription drugs sold in the United States contain natural substances, including aspirin and penicillin. Rayon, important in making cloth, comes from wood chemicals. How many other medicines, foods, and industrial uses of wild plants and animals are yet to be discovered?

Vocabulary

interdependent mutually relying on something or someone else

Activity 8

Web of Life Yarn Activity

Use activity sheets a through e on pages 9-13.

Duration: 30 minutes

Learning Objective:
Students kinesthetically demonstrate interdepen-dence in ecosystems. Students recognize how animals are connected to each other in food webs.

Method:
Students demonstrate how animals in an ecosystem are interdependent by connecting members of food webs with a continuous strand of yarn.

Materials:
A ball of yarn, Alaskan Animal Activity cards to be hung around the student's neck or backed with masking tape. (Additional cards involving plants may be introduced.)

Procedure:
Each student is assigned to be an animal.
It is acceptable to have multiples of an animal in the group. Hang an Animal Activity card around each child's neck or use tape.

Have the students sit or stand in a circle. Ask the students to build a food web by connecting animals that eat other animals with a strand of yarn until all members are connected.

Ask the students how many of the animals depend on sunlight, water, shelter, and space (room to roam and forage). All animals need these fundamentals of habitat. How many of the animals eat plants? Start with these herbivores and ask what animals eat them. Animals that eat other animals are carnivores and animals that eat both plants and animals are omnivores. Remember to connect back to the original member before connecting to the next animal.

Ask students to consider various scenarios…a forest fire, a drought, heavy snowfall, overhunting, pollution. Have all the animals that are affected raise their hands. As each species is affected, have them tug their yarn and see who else is affected by being connected to them. As each additional member is affected, have them tug their yarn as well.

Activity 9

Dominoes of the Natural World

Use activity sheet g on page 16.

Duration: 30 minutes

Learning Objective:
Students demonstrate how environmental factors can affect an entire ecosystem.

Method:
Interconnectedness of ecosystems (how animals and their environment are affected by one another) is demonstrated with falling dominoes.

Materials:
Several sets of dominoes and Alaskan Animal pictures, tape. (Additional cards labeled spruce, willow, berries, and man may be introduced.)

Procedure:
Have each student tape an animal bingo piece to the back of a domino. It is alright to have multiples of animal (and plant) types in the group.

Have the students form a circle around a surface that will allow dominoes to be positioned on end. Ask the students to build a web of connectedness between the animals on the dominoes they hold. You may have several branches of dominoes branching from a single domino. (Make sure they are close enough to be affected by the single domino). Start in the center with the lower members of the food web (plants or small animals).

Ask students to consider various scenarios…a forest fire, a drought, heavy snowfall, overhunting, pollution. With each scenario knock down the first affected animal (or plant) and observe which other dominoes also fall. After each scenario have the students rebuild the domino chain.

Other factors affecting ecosystems:
- a poor berry crop
- roads for a resort (roadkill)
- poachers or logging
- unusually hard winter
- pollution by pesticides
- the building of a shopping center

Activity 10
Biodiversity:
Tongue Rollers and Thumbprints

Duration: 30 minutes

Learning Objective:
Students experiment with the concept of biodiversity.

Method:
Students discover biodiversity in their own classroom in regard to different physical attributes.

Materials: None.

Procedure:
Although the term "biodiversity" is used to describe multiple species within an ecosystem or habitat, the concept can be demonstrated at a smaller scale by observing the differences in a single species. These differences are called "**variations**."

Ask the class how many students can roll their tongues. Discuss this physical feature as an element of biodiversity. Some students will be able to roll their tongues into a U-shape and others won't. Make a bar chart of rollers and non-rollers.

Compare attached ear lobes to non-attached and record.

Chin dimples or none. Cheek dimples or none. For further diversity record shoe size, hair color, curly or straight, and eye color.

Have each student compare their shoes with each other. Start with color, shoestrings, velcro, or slip-on, soft-sole or hard-sole, leather, canvas or other material. Record the results on a "tree diagram" on the blackboard.

Have each student press their thumb on a stamp pad and then on an index card. Have the students examine their thumbprints and compare them to other students in the class to see if they are alike. If possible, enlarge the thumbprints on a xerox. No two prints will be alike. How diverse we are!

Nose prints and whisker prints are used to identify dogs and lions. Footprints are taken of babies for identification. Label the thumbprints with the students' names and display them in the classroom or in the hall under the heading "Biodiversity in Action."

"What is man without the beasts? If all the beasts were gone, men would die from great loneliness of spirit, for whatever happens to the beasts, also happens to man. All things are connected…"

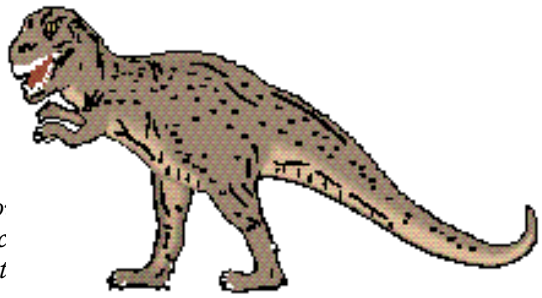
— Chief Seattle of the Dwarnish Tribe of Washington Territory in a letter written to President Franklin Pierce in 1855.

Vocabulary

biodiversity	the variety and abundance of organisms in an ecosystem
variations	differences among individuals in a population

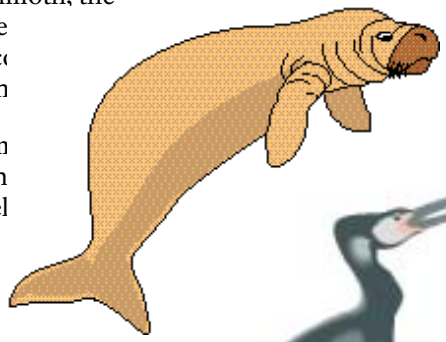
Staying Alive…Threatened, Endangered, Extinct

A primary threat to wildlife today is the destruction of habitats, which occurs when land is cleared for homes, shopping centers, farms, and other developments. Pollution is yet another factor in loss of habitat. As human populations grow, wildlife populations have decreased more and more. During the past few centuries, hundreds of species of animals (and plants) have completely died out or become **extinct**. Besides habitat destruction, uncontrolled hunting, fishing, and trapping, disease, and **predation** also contribute to animal extinctions. Many animals have been hunted for their hides.



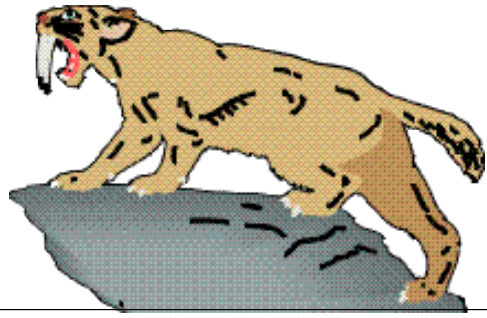
Note: Extinction is a natural process for all organisms on our planet. Species have appeared and disappeared over geologic time. It is the rate of extinction that has changed so drastically. In the past, three species would disappear every 100 years. At present, **there is a loss of two to three species per hour** *on the earth. At this rate, o next 500 years, one million different plants and animal spec will vanish forever. Extinction is occurring most rapidly in t tropics, where one half of the world's species live.*

Animals that have gone extinct in Alaska are the wooly mammoth, the Stellar sea cow, the Spectacled cormorant, dinosaurs like the Tyrannosaurus, and the Saber- toothed cat. The Steller sea c and the cormorant were killed by Russian hunters and colon



Many more species around the world are in danger of becon extinct. These **endangered** species will not survive unless th are protected. A species is considered **threatened** if it is likel become endangered in the near future. Both categories are usually associated with rapidly declining populations. Once a species is listed as endangered or threatened it is illegal to import, export, sell, trade, kill, harm, or remove the protected animals from the wild.

More than 600 plants and animals were on the endangered or threatened list in 1991. Endangered species in Alaska include the the eskimo curlew, the humpback whale, and the short-tailed albatross. Threatened species include the Steller's sea lion, the peregrine falcon, and the spectacled and Steller's eider. Species endangered or threatened in the lower 48, but common in Alaska include the grizzly bear, bald eagle, gray wolf, and the sockeye salmon.



Close Calls and Success Stories

Many animals have been identified as being in trouble and have been saved from extinction through help and protection by the state and federal governments, private organizations, and individual people.

The Bald Eagle in the Lower 48

In the 1960's, the bald eagle, symbol of our nation, reached a low in population of only 400 nesting pairs in the Lower 48. It was determined that the pesticide DDT was being ingested by eagles, the result being the production of thin-shelled eggs. Powerline collisions, loss of habitat and food source (fish), and hunting by farmers also contributed to the eagle's decline. Through protection of habitat, reintroduction of eagles to other areas, a strong education program, and the banning of DDT, the eagle population rebounded. In 1991, nesting pairs in the lower 48 increased to 3,000. In 1999, the status of the bald eagle was changed from endangered to threatened.

The Sea Ott

In 1742, Vitus Bering returne[d] to Alaska with sea otter pelts. Interest in this animal's fur almost wiped out the sea otter population. Finally, in 1911 when they were so scarce it was no long profitable to hunt them, sea otters were given protection under the Fur Seal Treaty signed by the United States, Great Britain, Russia, and Japan. From 1959-1972 the State of Alaska reintroduced sea otters into southeast Alaska. In 1972, sea otters became protected by the Marine Mammal Protection Act. From just 2,000 sea otters in 1911, the population grew to 110,000-160,000 in the 1970's.

The Alaskan Muskox

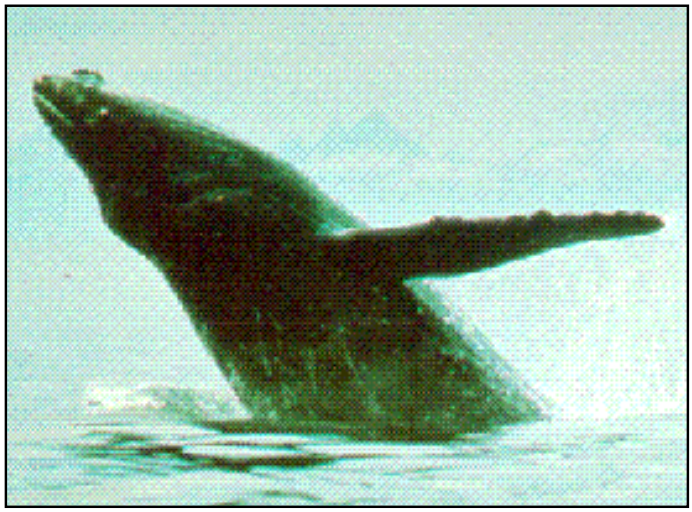
The return of muskoxen is another success story in conservation here in Alaska. The original Alaskan muskoxen disappeared in the mid to late 1880's because of overhunting by whalers and explorers as well as aboriginal hunters. In 1930, 34 muskoxen were captured in Greenland and brought to Fairbanks. In 1935, the muskoxen with their new calves were transported to Nunivak Island and released. Their population grew to 500 in 1990. Subsequent members of this herd have since been transplanted to the Arctic National Wildlife Range, the Seward Peninsula, and islands off the western coast of Alaska. There are over 2,000 muskox in Alaska today.

Kid's Summary

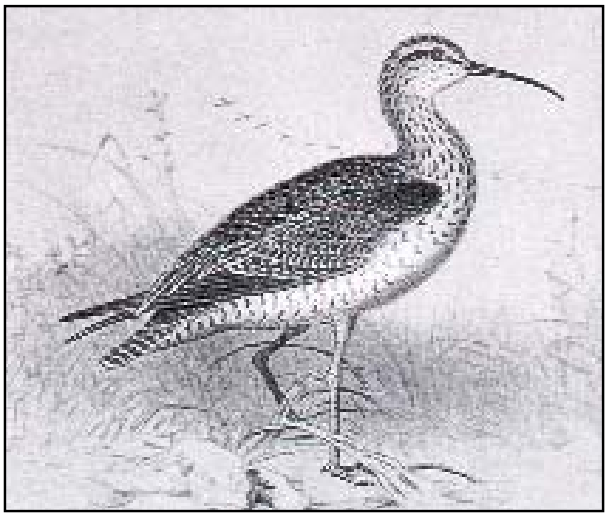
Extinct means "gone forever." Endangered means "almost gone." People taking over animals' habitat is one of the biggest causes of extinction.

Endangered Species of Alaska

Humpback Whale

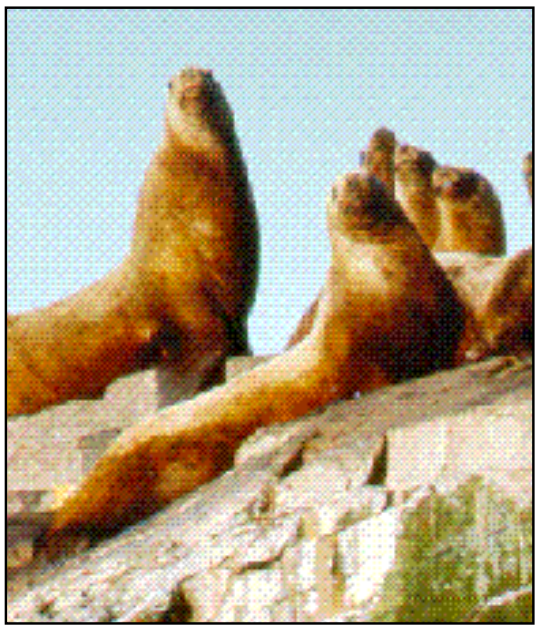


Short-tailed Albatross



Eskimo Curlew

Threatened Alaskan Populations



Steller's Sea Lion

Peregrine Falcon

Good News!

In August 1999, the peregrine was taken off the threatened species list. The Endangered Species Act really works!

Spectacled Eider

People and Parks Helping Wildlife

To save wildlife in varied ecosystems, state and federal government and other private organizations have worked to establish parks, preserves, and refuges. Some parks, like Gates of the Arctic National Park and Preserve, are attempts to preserve entire ecosystems from habitat destruction and interference by man.

Gates of the Arctic National Park and Preserve is located in the Brooks Range just west of the Dalton Highway near Coldfoot. It is the second largest national park in the nation (Wrangell-St. Elias is the largest), with six national wild rivers, and wide expanses of boreal forests, taiga, and alpine tundra. The summers are short and the winters see temperatures between -20 to -40 degrees (Fahrenheit) below zero. Among the inhabitants are grizzly, caribou, black bear, wolf, moose, Dall sheep, fox, and the peregrine falcon.

Interpretive Specialist Glenn Hart at Gates of the Arctic National Park and Preserve

The peregrine falcon is seen and heard in Gates of the Arctic more commonly than the raven and eagle. This falcon is a breathtaking flier, catching birds in midair dives of up to 200 mph. They migrate in the winter to the southern United States and Argentina.

Glenn Hart is an Interpretive Specialist at Gates of the Arctic National Park and Preserve. He is an Inupiat Eskimo, attended Sheldon Jackson College, and has worked at Sitka National Historical Park, Lake Clark, and Kenai Fjords National Park and Preserve. Glenn feels strongly about his park's mission of protecting the breeding grounds and nesting sites of the peregrine falcon. Few places in the nation are privileged to view the escapades of these magnificent birds.

National Parks throughout the nation play a crucial role in the recovery efforts of endangered species. Some parks contain all or a large part of the population of a species. Yellowstone, Glacier, and North Cascades National Parks are sanctuaries for the small number of grizzly bears still left in the Lower 48. Big Cypress National Preserve and Everglades National Park protect the last remaining populations of Florida panther. National parks stand as a symbol of hope in the fight to stop extinction.

Activity 11
Wanted Alive Posters

Use activity sheets k and l on pages 33 and 34 and sheet m on page 37.

Duration: 20 minutes

Learning Objective:
Students identify some of the animals that are endangered or threatened in Alaska.

Method:
Students make "Wanted Alive" posters featuring endangered and threatened Alaskan animals.

Materials:
Copies of the endangered and threatened Alaskan animals, copies of the Wanted Alive poster (on tan paper if possible), scissors and glue.

Procedure:
Each student is given or chooses a picture of an endangered or threatened Alaskan animal.

Have the students paste the animal's picture on the Wanted Alive poster and write the animal's name below the picture.

Have each student circle whether the animal is endangered or threatened. Display the posters in the classroom.

Extension:
Other pictures of the animals would give variation to the project. Publications by the U.S. Fish & Wildlife Service contain pictures of endangered and threatened species.

Vocabulary

endangered	to be threatened with extinction
threatened	likely to become endangered in the near future
extinct	no longer in existence
predation	the capture of prey for food

Activity 12
Musical Chairs of Extinction

Use activity sheets k and l on pages 33 and 34.

Duration: 30 minutes

Learning Objective:
Students demonstrate how animals become extinct in a kinesthetic simulation.

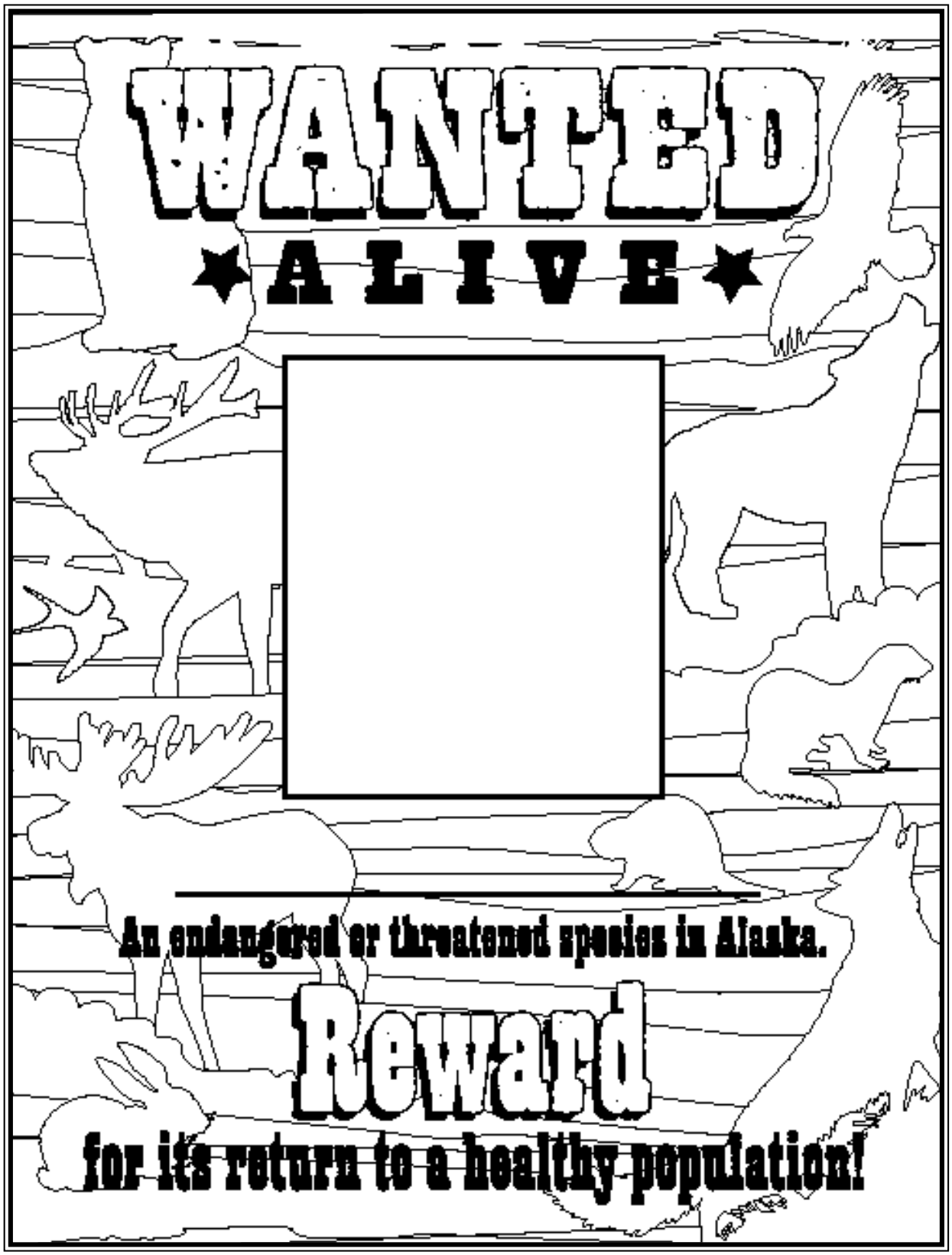
Method:
Students play musical chairs in a simulation of extinction, recognizing some of the factors that contribute to the loss of species.

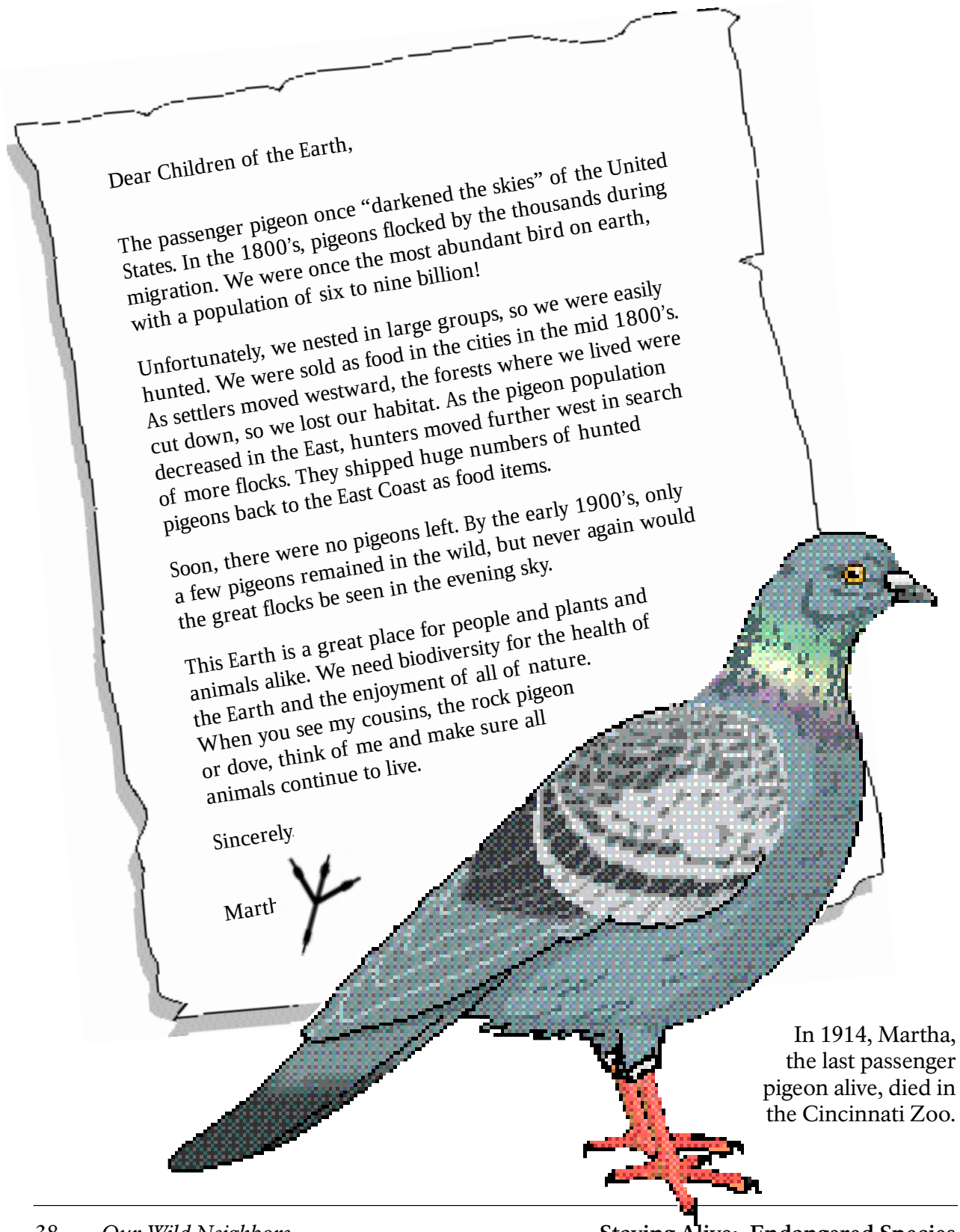
Materials:
Chairs, endangered and threatened Alaskan animal tags, music and tape player.

Procedure:
Give each student a tag with a picture of an endangered or threatened species that they can pin to their shirt or hang around their neck with yarn. With each round of musical chairs, remove a chair. As each student is removed from the game, explain what animal they represent and why they are threatened or extinct, giving the reasons below. Continue the rounds until all the endangered or threatened animals have been represented. Quiz the students on duplicates.

Reasons for declines in the population of each species follow:

- Short-tailed Albatross lost their habitat in Japan to a volcanic eruption.
- Eskimo Curlew were over- hunted for food from 1870-1890.
- The Stellar Sea Lion population has declined just recently (in the 1970's) due to shootings by fishermen and the loss of food sources (for unknown reasons).
- The Humpback whale was overhunted.
- The Peregrine Falcon declined because of the use of DDT for pest control.
- It is unknown why the Spectacled and Stellar's Eider have declined. Scientists believe it is a combination of loss of food source, pollution, and overharvest.


WANTED
ALIVE
An endangered or threatened species in Alaska.
Reward
for its return to a healthy population!



In 1914, Martha, the last passenger pigeon alive, died in the Cincinnati Zoo.

What Can I Do?

There are many things people, even kids, can do to help conserve ecosystems, biodiversity, and animal populations.

Educate yourself! Learn about ecosystems and the different animals that live in them. Already you have learned how all living things are interconnected. Make wise decisions about how humans affect ecosystems.

Support public lands that conserve habitats and animal populations. Many of our state and federal parks, forests, and refuges protect animals and their habitat. As human populations grow bigger and bigger, animals lose more and more of their habitat to homes and shopping centers.

Help conserve resources by recycling. Man's need for trees for homes, paper and other products reduces habitat. Mining and drilling for oil can also result in a loss of habitat. By recycling paper, glass, aluminum and tin cans, the need for new resources for human use is reduced. Ride your bike rather than using the car (and fuel). Use energy efficient appliances and light bulbs. Watch out for over-packaged foods!

Practice wildlife etiquette and Leave No Trace techniques.

Become a park ranger or biologist. Talk to a park ranger or biologist to see what they do. Park rangers, biologists, and many other professions dedicate their lives to protect wildlife, habitat, and ecosystems.

Wildlife Etiquette

Enjoy wildlife quietly and at a distance.

Never, absolutely never feed moose, bears, or other wildlife. "A fed animal is a dead animal." Animals that come to depend on people for food can become unpredictable and dangerous. The only animals it is legal to feed are songbirds.

Keep wildlife undisturbed; leash and fence your pet. Pets can chase wildlife, dig up nests, kill baby animals, or lead an angry mother or father back to you. A wild animal may injure or kill your pet in protection of its life or territory.

Animals and humans need it clean; pick up litter. Carry out all trash when you camp or hike. Animals may try to eat litter. Garbage attracts bears. Litter can entangle or trap wildlife, especially fishing line.

Help wild parents; avoid nesting areas. Respect mothers with young. Limit the time you watch young animals to five to ten minutes. You may be keeping a parent from warming its eggs or babies. Never get between a mother and its young.

Leave No Trace

- Keep on the main trail (no shortcuts) and use existing campsites. Don't crush flowers or small trees.
- Wash dishes at least 200 feet from water to prevent water pollution. Do not put soap, food, or human waste in lakes or streams.
- Bury human waste in a hole four to eight inches deep and 200 feet from water or trails.
- Leave plants and rocks where you found them.
- Do not dig trenches, break tree limbs, or mark plants or trees.
- Stash your trash. Pack it in, pack it out.
- Use a small campstove instead of a fire. If you do build a fire, build a rock ring to enclose it. Make sure your fire is out and the site is clean before you leave.

Activity 13

Wildlife Etiquette Rebus Story

Use activity sheet n on page 41.

Duration: 30 minutes

Learning Objective:
Students describe proper and improper behavior when around wildlife.

Method:
Students read or make a rebus story.

Materials:
Copies of "On the Way to School" and a copy of the rebus images for each child. Scissors and glue if the students are to create the rebus without already positioned images.

Procedure:
Have the students read the rebus story about behavior around moose. Students will need to determine what word each image represents.

If students are to glue the rebus images into the story, use correction tape or paper to cover the images on the story page and xerox one for each student. The teacher may want to put a small asterisk to mark the place for each image. Have the students determine where each image goes in the story and then glue the image in its place.

Extension:
Have the students create rebus stories of their own concerning wildlife etiquette.

On the Way to School

One day on my way to  this winter,  came across a  .

"Should I feed it an  ?" "No!,"  said to myself.

"Should I throw a  ?" "I don't think so,"  thought.

"Should I get closer?" "Absolutely not. That's  ."

"Should I  or yell?" "Nope, nope, nope",  said to myself.

"Should I let my  Sparky out to chase it away?" "Of course not."

Instead, I went back to my  and told my  She took me to

 in the  . She also  the neighbors so they would know

about the guest. My friend Jack  way around the moose on another  .

Later in the spring, the  had a   . It was really cute on

its wobbly  . We watched from inside the  because an animal 

will defend its littl  .  said if  are too bothered by people,

they might not make it through the winter. I'm glad they did because now

there is another  to watch.   

Educational Resources

Numerous resources are available in the various communities around Alaska. Resources include education programs, speakers and programs at school sites, live animal presentations, education kits, special events and contests, teacher curricula and workshops, library & video loans, posters, books and brochures. Speakers and classroom visits are available on a limited basis from many state and federal agencies.

Education Kits are available from a number of agencies and organizations including the Alaska Science Center at Alaska Pacific University, U.S. Fish & Wildlife Service via the Alaska Resources Library & Information Services in Anchorage and their office in Fairbanks, the Department of Fish & Game in Anchorage, Juneau, and Fairbanks, the Alaska State Museum, Alaska Women in Timber in Ketchikan, the Pratt Museum in Homer, and the Alaska Public Lands Information Centers in Ketchikan, Fairbanks, and Anchorage. Topics for educational kits include birds, bald eagles, geese, owl pellets, raptors, seabirds, songbirds, waterfowl, loons, beak adaptations, bears, wolves, fur, insects, salmon, fish, Alaskan mammals, marine mammals, sea otters, whales, animal scents, tracks, skulls, trees, forest, tundra, beachcombing, sea, wetlands and wetland wildlife, fire, arctic summer, endangered species, the Oil Spill, Leave No Trace, and water quality.

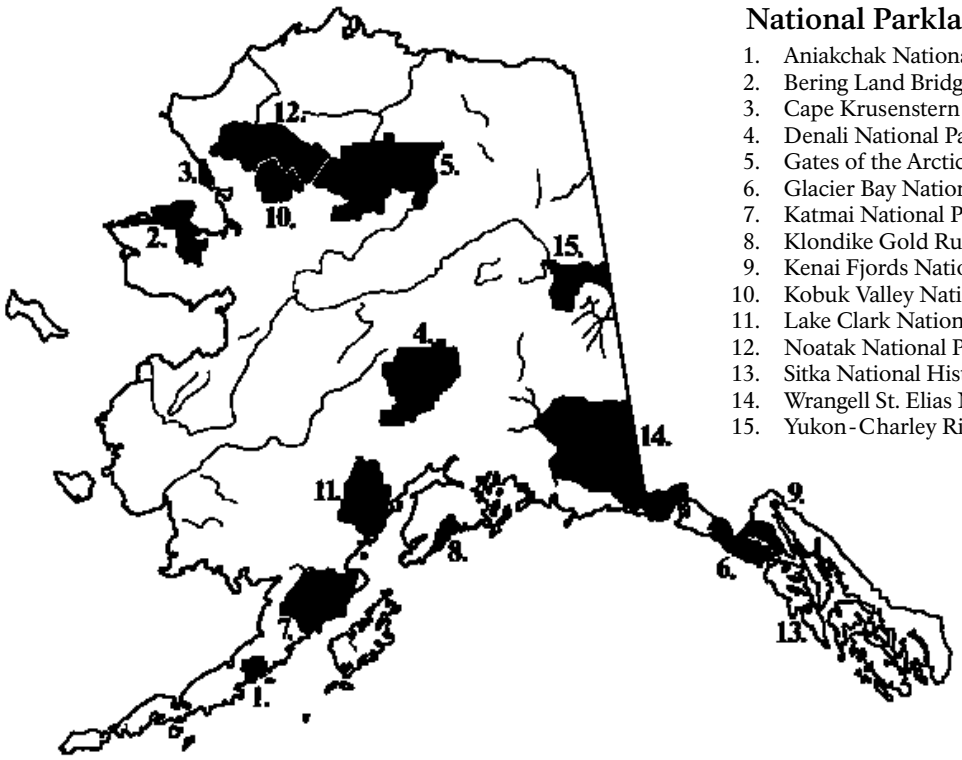
Alaska Natural Resource and Outdoor Education Association (ANROE) is a state -wide network of educators who provide workshops, a quarterly newsletter, and grants for projects. The organization also produces a Guide to Alaska Natural Resource Education Materials describing resources available to educators in the state. Contact the organization at P.O. Box 110536, Anchorage, AK 99511-0536. http://www.anroe.org

ALASKA
PUBLIC LANDS INFORMATION
CENTERS

Alaska Public Lands Information Centers in Ketchikan (Southeast Alaska Discovery Visitor Center), Fairbanks, and Anchorage all have **on-site, hands-on programs** for students. Programs are usually menu-style with a selection of introduction, scavenger hunt/worksheet, and/or movie. Educational kits and library materials are also available. Topics include Alaskan animals, birds, fish, wolves, whales, insects, trees, habitat, wetlands, adaptations, the Gold Rush, and maps. Fairbanks holds a Discovery Day once a month on selected topics. The Anchorage APLIC also presents a puppet show about Alaskan animals at local schools at no charge. Educational contacts are as follows:

Ketchikan:	Education Specialist	228-6214
Fairbanks APLIC:	Education Specialist	456-0527
Anchorage APLIC:	Joanne Welch	271-2741

Contact the APLIC website for more information on current educational programs at **http://www.nps.gov/aplic**



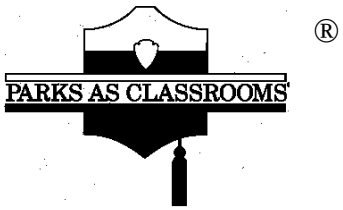
National Parklands in Alaska

1. Aniakchak National Monument & Preserve
2. Bering Land Bridge National Preserve
3. Cape Krusenstern National Monument
4. Denali National Park & Preserve
5. Gates of the Arctic National Park & Preserve
6. Glacier Bay National Park & Preserve
7. Katmai National Park & Preserve
8. Klondike Gold Rush National Historical Park
9. Kenai Fjords National Park
10. Kobuk Valley National Park
11. Lake Clark National Park & Preserve
12. Noatak National Preserve
13. Sitka National Historical Park
14. Wrangell St. Elias National Park & Preserve
15. Yukon-Charley Rivers National Preserve

National Parks in Alaska offer a variety of education opportunities including teacher workshops, children's programs, special events, educational kits and materials, field camps, and Jr. Ranger programs. Contact the education specialist or ranger at the following park sites in Alaska:

Bering Land Bridge National Preserve	Nome	443-2522
Denali National Park and Preserve	Denali Park	683-6353
Gates of the Arctic National Park and Preserve	Fairbanks	692-6103
Glacier Bay National Park and Preserve	Gustavus	697-2650
Katmai National Park and Preserve/Aniakchak National Monument and Preserve	King Salmon	246-2131
Kenai Fjords National Park	Seward	224-3175
Klondike Gold Rush National Historical Park	Skagway	983-9221
Lake Clark National Park and Preserve	Port Alsworth	246-2131
Northwest Areas: Kobuk Valley National Park, Cape Krusenstern National Monument, Noatak National Preserve	Kotzebue	442-3890
Sitka National Historical Park	Sitka	747-6281
Wrangell-St. Elias National Park and Preserve	Copper Center	822-7238
Yukon-Charley Rivers National Preserve	Eagle	547-2233

Contact the National Park Sevice website at http://www.nps.gov/alaska for more information.



The National Park Service is dedicated to providing high quality educational experiences to diverse audiences. The NPS Parks as Classrooms program is just one part of this goal. The Parks as Classrooms program strives to provide curriculum-based programs that meet the needs of local schools while providing educational opportunities for a national constituency. Parks as Classrooms is a decentralized program that encourages parks or groups of parks to work with local school districts to integrate park themes into multi-disciplinary curriculum and to share those results nationally.

Since 1991, the National Park Service has funded nearly 500 education projects through the Parks as Classrooms program, reaching over 3.5 million students and 65,000 teachers.

For additional information about the National Park Service, visit the ParkNet website at http://www.nps.gov

The Our Wild Neighbors teacher workbook was written by Joanne Welch, Education Specialist with the National Park Service at Alaska Public Lands Information Centers. If you would like a copy, please contact Joanne at 271-2741.

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