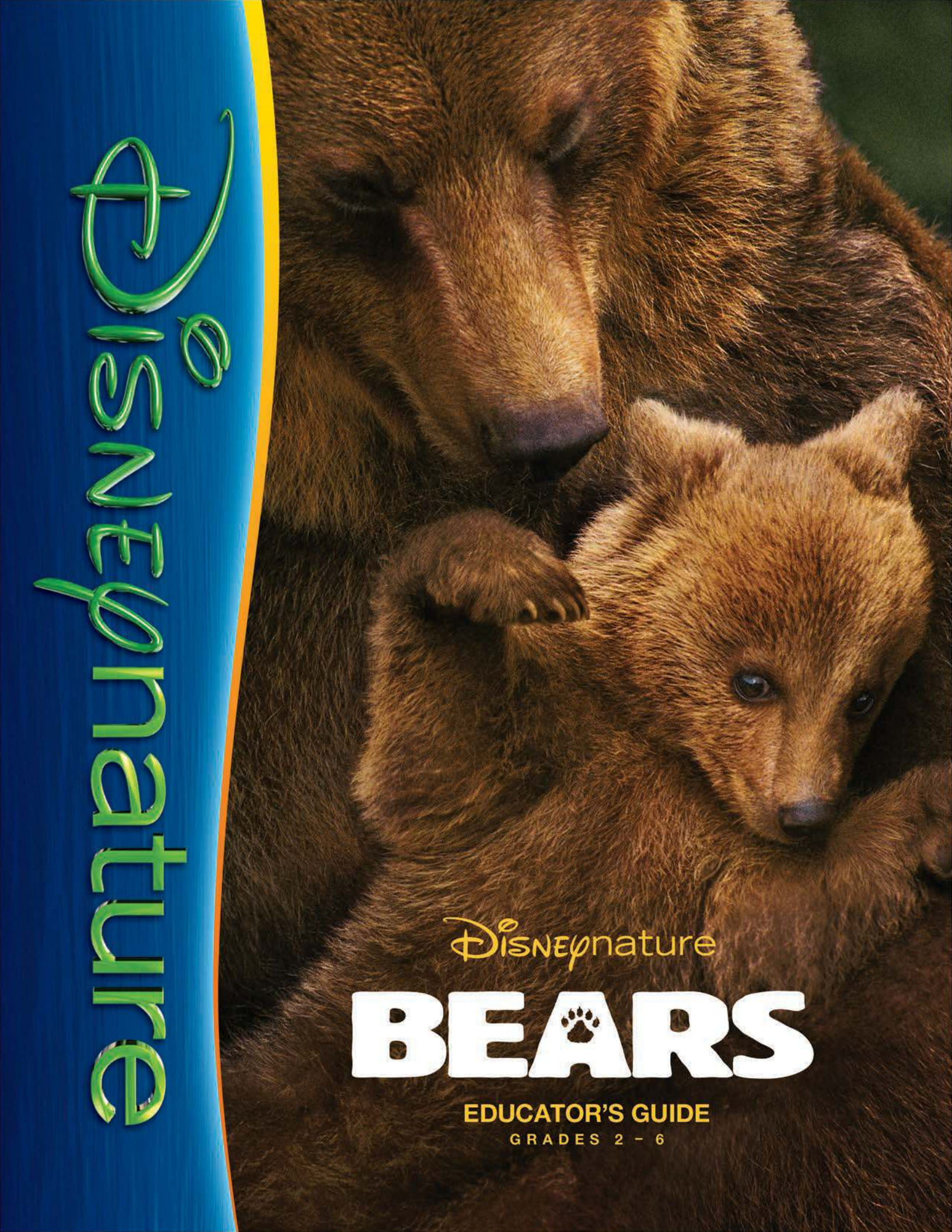

Disneynature
BEARS
EDUCATOR'S GUIDE
GRADES 2 – 6

Disneynature

BEARS

EDUCATOR'S GUIDE | GRADES 2 – 6

This Earth Day You're Invited into the World of BEARS!

In an epic story of breathtaking scale, Disneynature's new True Life Adventure **BEARS** showcases a year in the life of a bear family as two impressionable young cubs are taught life's most important lessons. Set against a majestic Alaskan backdrop teeming with life, their journey begins as winter comes to an end and the bears emerge from hibernation to face the bitter cold. The world outside is exciting–but risky–as the cubs' playful descent down the mountain carries with it a looming threat of avalanches. As the season changes from spring to summer, the brown bears must work hard to find food–ultimately feasting at a plentiful salmon run–while staying safe from rival male bears and predators, including an ever-present wolf pack. **BEARS** captures the fast-moving action and suspense of life in one of the planet's last great wildernesses–Alaska!

Directed by Alastair Fothergill ("Earth," "African Cats" and "Chimpanzee") and Keith Scholey ("African Cats"), **BEARS** arrives in theaters April 18, 2014, to celebrate Earth Day.

Further Explore the World of Bears

The **BEARS** Educator's Guide includes nearly 100 pages of lessons and activities targeted to grades 2 through 6. The complete Educator's Guide and additional educational resources are now available at **disney.com/bears**.

The guide introduces students to a variety of topics, including:

- Habitats and Ecosystems
- Animal Adaptations
- Biodiversity
- Food Webs and Chains
- Learned Behaviors
- Protecting Bears
- Use of Technology to Study Bears
- Making a Positive Difference for Wildlife Worldwide

SEE BEARS • PROTECT OUR NATIONAL PARKS •

Buy a ticket for Opening Week (April 18-24) and Disneynature will make a contribution to the National Park Foundation to protect wildlife and wild places across America's national park system. Learn more at disney.com/bears.

NATIONAL PARK FOUNDATION

EDUCATOR'S GUIDE OBJECTIVES

- ✓ Increase students' knowledge of brown bears and their habitats through interactive, interdisciplinary and inquiry-based lessons.
- ✓ Enhance students' viewing of the Disneynature film **BEARS** and inspire appreciation for the wildlife and wild places featured in the film.
- ✓ Promote life-long conservation values and STEM based skills through outdoor natural exploration and discovery.
- ✓ Empower you and your students to create positive changes for wildlife in your school, community, and world.

Lessons align to Next Generation Science Standards, National Science Standards, and Common Core Language Art and Math Standards.

Partnership for 21st Century Skills

THIS FILM IS NOT YET RATED

CALL 1-888-DISNEY6 to reserve group tickets for your class!

Schedule your class trip early to see BEARS so you and your class can further explore bears! Starts in Theatres April 18!

Table of Contents

Acknowledgements

Creating such a collaborative Educator's Guide takes the energy, innovation, talent and hard work of many specialists.

At the Walt Disney Company, both Disneynature's Paul Baribault and Catherine Stephens demonstrated their commitment to education by supporting the Disney's Animal Kingdom Education Team in taking on this exciting project. Dr. Liz Fogel brought all the right partners together to create an interdisciplinary Educator's Guide that genuinely challenges and engages both teachers and students.

At Disney's Animal Kingdom, Laurie Cummins developed and wrote the brilliant lessons and activities along with her team of conservation educators, Erika Talatinian and Colleen Tonkovic. Kris Whipple told the complete story of brown bears using interpretive descriptions and relevant examples through the Teacher's Background Information. Joe Christman applied his years of experience in the zoological field to ensure the accuracy of all information. Gina Ferrie assisted us in bringing DNA sequencing to 4th and 6th graders. Allyson Atkins and Dr. Jill Mellen reviewed and commented on the final draft to ensure a quality product. Roy Wood, Chief of Interpretation, Education, and Partnerships at Katmai National Park and Preserve, brought his first-hand knowledge and expertise to this guide serving as our content expert on brown bears in Katmai National Park.

This interdisciplinary Guide that includes curriculum links and direct classroom experience was provided by our creative, fun and knowledgeable subject matter experts, including Doctors John Hoge, Linda Labbo, NaJuana Lee, John Olive, Michael Orey and Deborah Tippins from the University of Georgia and Dr. Wayne Nelson from the University of Southern Illinois.

Kathy Lehnhardt

Curator of Education
Disney's Animal Kingdom

Disneynature
BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

National Standards Alignment Chart
Next Generation Science Standards

Lesson Title	NEXT GENERATION SCIENCE STANDARDS	2nd Grade – Biological Evolutions: Unity & Division	K-2 Engineering Design	3rd Grade – From Molecules to Organisms: Structure & Processes	3rd Grade - Ecosystems: Interactions, Energy & Dynamics	3rd Grade – Heredity: Inheritances & Variation of Traits	3rd Grade – Biological Evolution: Unity & Diversity	4th Grade – From Molecules to Organisms: Structures & Processes	5th Grade – Energy	5th Grade – From Molecules to Organisms: Structures & Processes	5th Grade – Ecosystems: Interactions, Energy & Dynamics	5th Grade – Earth & Human Activity	3rd through 5th Grades – Engineering Design	6th Grade – From Molecules to Organisms: Structures & Processes	6th Grade – Ecosystems: Interactions, Energy & Dynamics	6th Grade – Heredity: Inheritance & Variation of Traits	6th Grade – Biological Evolution: Unity & Diversity	6th Grade – Earth & Human Activity	6th Grade – Engineering Design
Where do Brown Bears Live?		LS 4-1: LS 4.D					LS 4-4				LS 2-1: LS 2.A				LS 2-1: LS 2.A				
How Much Space do Brown Bears Need to Survive?								LS 1-2: LS 1.D						LS 1-8: LS 1.D					
Who are a Brown Bear's Neighbors?		LS 4-1: LS 4.D					LS 4-3: LS 4.C LS 4-4: LS 4.D				LS 2-1: LS 2.A				LS 2-2: LS 2.A LS 2-4: LS 4.B LS 2-5: LS 2.D		LS 4-6: LS 4.C		
How do I Compare to a Bear?							LS 4-3: LS 4.C	LS 1-1: LS 1.A LS 1-2: LS 1.D						LS 1-8: LS 1.D			LS 4-6: LS 4.C		
What do Alaskan Animals Eat?		LS 4-1: LS 4.D					LS 4-2: LS 4.B				LS 2-1: LS 2.A								
How does Energy Flow Through an Alaskan Animal Food Web?									PS 3-1: PS 3.D	LS 1-1: LS 1.C	LS 2-1:LS 2.A&B				LS 2-1:LS 2.A&B				
How do Brown Bear Cubs Learn and Grow?				LS 1-1: LS 1.B		LS 3-1: LS3.A LS 2-3: LS3.A&B													
How do Scientists use Footprints to Study Bears?		LS 4-1: LS 4.D	ETS1-1: ETS1.A		LS 2-1	LS 3-1: LS 3.B LS 3-2: LS 3.B	LS 4-4: LS 2.C												
What Methods do Scientists use to Study Brown Bear Populations Worldwide?													ETS1-1: ETS1.A ETS1-2: ETS1.B ETS1-3: ETS1.B&C	LS 1-1: LS 1.A LS 1-5: LS 1.B		LS 3-1: LS 3.A&B LS 3-2: LS.A&B			ETS1-1: ETS1.A ETS1-2: ETS1.B ETS1-3: ETS1.B&C ETS1-4: ETS1.B&C
How Can I Safely Visit Bear Country?			ETS1-1: ETS1.A ETS1-1: ETS1.B		LS 2-1		LS 4-4: LS 2.C & LS 4.D												
How Can People Live Safely with Bears?												ESS3-1: ESS3.C	ETS1-1: ETS1.A ETS1-2: ETS1.B ETS1-3: ETS1.B&C					ESS3-3: ESS3.C ESS3-4: ESS3.C	

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

National Standards Alignment Chart
National Science Standards K – 4 and 5 – 8

Lesson Title	NATIONAL SCIENCE STANDARDS K – 4								NATIONAL SCIENCE STANDARDS 5 – 8										
	Abilities to do scientific inquiry	Understanding about scientific inquiry	Characteristics of organisms	Life cycle of organisms	Organisms and environment	Understanding about science and technology	Characteristics and changes in populations		Ability to do scientific inquiry	Understanding about scientific inquiry	Transfer of energy	Structure and function of living systems	Reproduction and heredity	Regulations and behavior	Populations and ecosystems	Diversity and adaptation of organisms	Abilities of technological design	Understanding about science and technology	Populations, resources and environment
Where do Brown Bears Live?			●		●										●				
How Much Space do Brown Bears Need to Survive?	●		●		●				●						●				
Who are a Brown Bear's Neighbors?					●											●			
How do I Compare to a Bear?	●		●		●				●			●				●			
What do Alaskan Animals Eat?			●		●						●				●				
How does Energy Flow Through an Alaskan Animal Food Web?									●		●				●	●			
How do Brown Bear Cubs Learn and Grow?			●																
How do Scientists use Footprints to Study Bears?	●	●			●	●													
What Methods do Scientists use to Study Brown Bear Populations Worldwide?									●	●			●		●			●	●
How Can I Safely Visit Bear Country?					●		●												
How Can People Live Safely with Bears?					●		●							●	●				●

Disney nature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

National Standards Alignment Chart
Common Core Language Arts and Math Standards

Lesson Title	COMMON CORE LANGUAGE ARTS STANDARDS: Reading Literature	Reading Informational Text	Writing	Speaking & Listening	Language	COMMON CORE MATH STANDARDS: Operations & Algebraic Thinking	Measurement & Data	Geometry	Ratios & Proportional Relationships	Expressions & Equations
Where do Brown Bears Live?	🐾	🐾	🐾			4.OA.A.3		6.G.A.1		6.EE.A.2C
How Much Space do Brown Bears Need to Survive?							3.MD.B.4 3.MD.C.5a 3.MD.C.6 4.MD.A.1 4.Md.A.2			
Who are a Brown Bear's Neighbors?	🐾	🐾	🐾	🐾	🐾					
How do I Compare to a Bear?							2.MD.A.1 2.MD.A.4 3.MD.B.4 4.MD.A.1 5.MD.A.1			
What do Alaskan Animals Eat?							3.MD.A.2 4.MD.A.1 4.MD.A.2			
How does Energy Flow Through an Alaskan Animal Food Web?						5.OA.B.3			6.RP.A.3 6.RP.A.3c	
How do Brown Bear Cubs Learn and Grow?		🐾	🐾	🐾			2.MD.A.1 2.MD.A.4 2.MD.D.10 3.MD.B.4			
How do Scientists use Footprints to Study Bears?		🐾	🐾	🐾						
What Methods do Scientists use to Study Brown Bear Populations Worldwide?	🐾	🐾	🐾	🐾				5.G.A.1 5.G.A.2 6.G.A.3		
How Can I Safely Visit Bear Country?										
How Can People Live Safely with Bears?		🐾	🐾	🐾						

WELCOME to the WORLD of BEARS

Why Are Brown Bears Important?

Bears are a part of our culture: For thousands of years, people and bears have shared the land. Pictographs in central Montana dating back 3,000 years illustrate the importance of bears to prehistoric humans. Brown bears are considered to be an enduring symbol of true wilderness in North America. Their strength, power and beauty have inspired our respect, fear and admiration. Many native Americans believe brown bears possess special powers and can even take on human form.

Bears are like us! Bears are more like us than you might think. They sometimes stand on two feet, use their paws to reach for things and eat both plants and meat. Female bears are great moms. They fiercely protect and care for their cubs for their first two years. During that time mothers teach their cubs how to survive on their own.

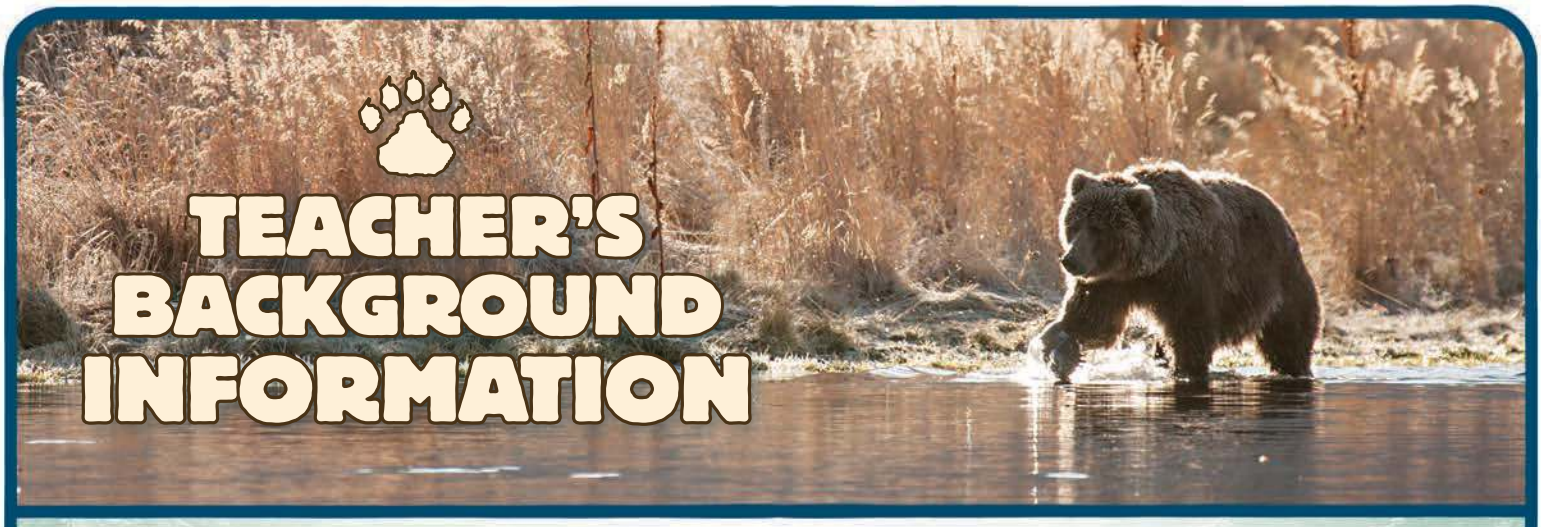
Bears keep our environment healthy: Brown bears keep wildlife populations healthy and strong by feeding on sick and weak individuals. They keep plant-eating animal species from overpopulating and help forests grow by spreading seeds. Natural areas that support bears are home to many other animals. So by protecting bears, we protect other wildlife too.

Bears are survivors: At one time brown bears were scarce in the continental US and headed for extinction. Today America's greatest predator is making a comeback! Their recovery is one of our biggest conservation success stories and represents what we can accomplish when we all work together!

Bears share our space: As bear and human populations grow, conflict for space and resources between the two are on the rise. By becoming bear aware – learning ways to avoid unwanted or unsafe encounters – and teaching others what you've learned, you can create a brighter future for bears.

SAFETY OUTDOORS

Connecting children to nature means taking them outdoors into the beauty of nature. In order to ensure a safe experience, we suggest you walk the outdoor area the day before to look for any potential safety hazards. Be aware of any plants that might cause skin irritation such as poison ivy. The goal is to have a fun, immersive, safe experience outdoors.



TEACHER'S BACKGROUND INFORMATION

MEET THE BROWN BEAR

- LESSON 1: Where do brown bears live?
- LESSON 2: How much space do brown bears need to survive?

Brown bears are the most widely distributed species of bear in the world. While its numbers and range have diminished over time, its global distribution still makes this one "worldly" bear!

An International Species

Internationally, brown bears live in Eastern and Western Europe, in the Himalayan Mountains of Asia and Japan's Hokkaido Island. In North America, about ninety-five percent of the brown bear population (about 32,000 bears) lives in Western Canada and Alaska. The remaining five percent live in Idaho, Montana, Washington and Wyoming.

Brown Bears in Britain?

Imagine encountering a brown bear in California, the Mexican desert or even the British Isles. At one time, brown bears lived in these places and many more! In fact the brown bear once ranged throughout Europe, Asia, the Middle East, North America and North Africa.

Before European settlement, about 100,000 brown bears roamed North America, from California to the Great Plains and from Central Mexico to the Arctic Ocean. By the late 1800's, the brown bear had been eliminated from much of its previous range. By 1975, fewer than 1,000 brown bears remained in the lower 48 states. Hunting, trapping, government eradication programs and conversion of habitat for settlement, farms and agricultural grazing all took their toll. Today, only one percent of the brown bear's historical habitat remains within the lower 48 states. Sadly, the Atlas Bear of North Africa, the California Golden Bear (pictured on the California State Flag) and the Mexican Bear (all brown bear sub-species) were hunted to extinction in the 19th and 20th centuries.

Habitat: Finding a Home with the Bear Essentials

Like humans, every animal needs a habitat or home where they can find the food, water and cover needed to survive and raise young. In addition to plentiful food sources in the summer, spring and fall, brown bears require water sources like streams, rivers and lakes, sheltered areas for winter dens and thick vegetation for hiding, bedding and raising cubs. Access to these "bear necessities" define a brown bear's **home range** – the area where they live, travel, conduct their daily activities and raise their young. Brown bears are highly adaptable and thrive in a variety of habitats – more than any other bear species! These include tundra, alpine meadow, grasslands, forest, coastal sedge meadow and even semi-desert habitats. They may travel through multiple habitats in a single day or season as they follow changing food supplies, seasonal water sources or shelter.

Home Range: Finding Room to Roam

The size of a brown bear's home range varies from region to region, year to year and season to season, based primarily on the availability of high energy foods like fish or grubs. The more concentrated the food source, the smaller the bear's range needs to be. Males typically have a larger home range than females. Since males are larger they often have to travel farther to find food. In the summer, they may travel further to find a mate. Since cubs are unable to travel far, females with cubs have the smallest home range. A female may only require 50 to 150 square miles (80 to 240 square kilometers) where an adult male brown bear living in the mountains of Montana may require a home range of 600 square miles (965 square kilometers) to survive. Some males require up to 1,500 square miles (2,414 square kilometers) in their lifetime! In contrast, bears living on the Alaskan coast, including those in Katmai may only require 10 square miles (16 square kilometers) due to the abundance of protein rich salmon and clams. Unlike wolves that actively patrol and defend the borders of their **territory**, the solitary brown bear does not. In fact, the home ranges of individual bears often overlap. When food is scarce a bear may defend its favorite fishing spot, berry patch or lush grassy sedge meadow. But brown bears may also gather in large groups at major food sources like salmon runs. Here, order is maintained and hierarchies are formed through aggression. Adult males are the highest-ranking or **alpha** bears; adolescent bears are the least aggressive and lowest-ranking in this hierarchy.

Brown Bear Diets: From Fish to Nuts

Brown bears are furry eating machines and spend a good part of their waking hours **foraging** or looking for food. Brown bears are **omnivores**; their diet is a surprising mix of animals and plants. Brown bears are also opportunistic feeders. To them, their habitat is one big grocery store and they are quick to eat anything that catches their attention. This may include grass, roots, nuts, fruit, berries, ants, grubs, small mammals like squirrels and marmots or larger animals like deer, caribou and bison. They will even feed on **carrion** (remains of dead animals) left behind by other animals. This diverse diet allows brown bears to live in a variety of habitats. A brown bear's diet varies by region. In interior mountain habitats like Yellowstone National Park, brown bears feed on elk and bison. In Katmai and other coastal areas, clams and salmon are the primary protein sources. A brown bear's diet also varies by season. They will travel through different ecosystems during the year as food becomes available. The same bears that fish the river in the summer may dine on moths or pine seeds from the forest in the fall. Before winter, brown bears eat almost around the clock and gain an average of three pounds (over one kilogram) per day. These fat reserves are essential for surviving the four-to-seven months of winter when food is unavailable.

WELCOME TO KATMAI NATIONAL PARK AND PRESERVE

Land of Fire, Water and Brown Bears

- LESSON 1: Where do brown bears live?
- LESSON 2: How much space do brown bears need to survive?
- LESSON 3: Who are a brown bear's neighbors?
- LESSON 5: What do Alaskan animals eat?
- LESSON 6: How does energy flow through an Alaskan food web?

The adventures of our bear family take place in Alaska's Katmai National Park and Preserve. This stunning wilderness is located on the Alaska Peninsula – a long, curving land mass that extends 500 miles (800 kilometers) westward into the Pacific. Katmai National Monument was established in 1918 to preserve the famed Valley of Ten Thousand Smokes – a 40 square mile (64 square kilometer), 100 to 700 foot deep (30 to 213 meters) ash flow that was deposited by the Novarupta Volcano in 1912 during the most powerful volcanic eruption of the 20th century. Over time the monument became known for its remarkable wildlife and particularly, its population of brown bears. Protecting this amazing species and its habitat eventually became as important to the Park's mission as preserving its geothermal features. Katmai's boundaries were later expanded to protect additional habitat and in 1980 Katmai was designated as a national park and preserve. Today Katmai is still famous for volcanoes, but also for brown bears, pristine waterways, abundant fish, remote wilderness and rugged coastline.

Katmai: The Perfect Home for Bears

Over 2,000 brown bears call Katmai home and it's no wonder! For one thing, Katmai is big! At over four million acres (1.6 million hectares), Katmai National Park is about the size of New Jersey, giving brown bears plenty of room to roam. Katmai is also remote. Much of the park lacks roads, making it extremely difficult to access. This means there's little interference from humans. A variety of ecosystems, including spruce forests, meadows, rocky shorelines, mud flats, sedge meadows and an abundance of lakes, ponds and rivers means plenty of food, water and shelter for bears and their cubs. The Katmai coast is a particularly rich source of highly nutritious foods including clams and marsh plants like salmonberry, grasses and sedges. In summer, bears dine on salmon migrating upstream to lay their eggs. Each year over a hundred brown bears descend on a one mile (1.6 kilometer) long stretch of the Brooks River to feast on the largest sockeye salmon run in the world. These fish and their eggs provide the calories, fat and protein that brown bears need to survive the winter.

A Delicate Balance: Everything in Katmai is Connected

Katmai is diverse and home to many unique ecosystems. Each is a community of living and non-living things that

interact and depend on each other to survive. Like all ecosystems, the plants and animals within Katmai's ecosystems are connected by what they eat. Every organism needs energy to live. **Food chains** transfer energy from one living thing to another in the form of food, starting with the sun's energy. Plants (**producers**) use sunlight along with water and nutrients from the soil to grow. When the plants are eaten by **herbivores** (plant-eating animals) or **omnivores** (animals that eat plants and animals) this energy is transferred from plants to animals. Some of these animals become prey for **carnivores** (meat-eating animals) transferring the energy yet again. When animals die, their bodies (called **carrion**) become food for **scavengers** (animals that eat the remains of dead animals). The remains that scavengers leave behind are broken down by **decomposers** like flies, bacteria and fungi. The energy returns to the soil as nutrients and the cycle begins again. When many food chains overlap they create a food web. Because every animal in a **food web** is intricately connected, the disappearance of even one organism can impact other organisms in an ecosystem.

Sharing Resources: Working Together to Keep Katmai Healthy

Every plant and animal within Katmai's ecosystems has a niche or role. **Decomposers** break down dead plants and animals so the nutrients can return to the soil. This nourishes the soil and keeps the ecosystem clean. Hoofed herbivores like Dall's sheep, caribou and moose are the "gardeners" of Katmai. Their foraging keeps sedge meadows and lakes from becoming overgrown. Their hooves aerate the soil, making it easier for plants to grow. Herbivores also spread seeds and fertilize the forests and sedge meadows with their scat (dung). This ensures a constant food supply for themselves and other species. Without them, the plants, animals and ultimately the ecosystem itself would disappear. Large herbivores as well as smaller plant eaters like birds, rodents and plant-eating insects often become **prey** (food) for larger **predators** (animals that hunt and eat other animals) like brown bears, wolves, foxes, eagles and salmon. By feeding on prey species, predators prevent their numbers from exceeding their food supply. By hunting prey that are sick, weak or old, predators also keep prey populations strong and healthy.

Because brown bears are omnivores, predators and scavengers, they fill many niches. As omnivores they help plants grow by spreading seeds in their scat. By digging for roots, bulbs and burrowing rodents they aerate the soil and bring nitrogen to the surface. This helps plants that need nitrogen-rich soil to grow. By eating salmon, brown bears pass nutrients from the ocean ecosystem to the forest. As predators, brown bears also keep prey populations healthy and balanced. By eating carrion, brown bears help keep their habitat clean.

Meet the Neighbors

Besides brown bears, Katmai provides a protected home for caribou, red fox, wolf, lynx, wolverine, river otter, mink, marten, weasel, porcupine, snowshoe hare, red squirrel and beaver. Moose live throughout the Park's coastal and lake regions. Sea lions, sea otters and hair seals reside on

the Park's coastline. Beluga, orca and gray whales navigate the coastal waters. Almost 50 types of songbirds spend their summers in the Park. Seabirds reside along the coast and grouse and ptarmigan inhabit the uplands. Bald eagles, hawks, falcons, owls, tundra swans, ducks, loons and grebes nest on sea cliffs, marshes and lake shores. In the rivers, trout and migrating salmon provide food for brown bears, bald eagles and other creatures.

Katmai's Animal Residents: Built to Survive Alaska's Extremes

Katmai's animal's residents have special adaptations (physical and behavioral traits) that help them find food, avoid predators, survive Alaska's climate and much more:

• **Power in Numbers:** Some animals like wolves and caribou survive by living in groups. By hunting together, wolves can catch larger, faster, prey and are better equipped to protect themselves and their food from other predators. Large herbivores like caribou also find protection in large herds; with so many eyes watching for predators the whole group has time to flee.

• **Unique Feet:** Dall's sheep have flexible hooves that provide stable footing on rocky, steep terrain. The caribou's hooves are large and spreading and on snow they function like snowshoes. The underside is hollowed out like a scoop and used for digging through the snow for food. In the water, these hooves function like paddles.

• **Super Senses:** Foxes use their keen sense of hearing and smell to avoid enemies and hunt for food. Their large ears magnify sounds like stereo speakers, allowing them to hear tiny prey animals like mice from far away and even under the snow. Foxes also have an excellent sense of smell thanks to the 200 million scent receptors in their nose!

• **Animal Weaponry: Teeth, Talons and Quills:** Foxes, wolves, eagles and porcupines rely on "weapons" for protection or to acquire food. Sharp, pointed canine teeth help foxes and wolves grab their prey and protect themselves from other predators. Porcupines protect themselves with needle-like quills. Each has a sharp tip and overlapping barbs that make them difficult to remove once they are stuck in another animal. Eagles use their strong muscular toes and sharp claws called talons to capture and hold fish and other prey.

• **Built to Travel:** Some species use strength and speed to survive. With their narrow chests, powerful backs and long legs, wolves are built for stamina and long distance travel. They can trot for hours at a time and run at speeds of 40 miles (64 kilometers) per hour during a chase. Porcupines are agile tree climbers thanks to their long, curved nails and pebbly textured foot pads. Their muscular tail helps them balance among the branches. The snowshoe hare's large, furry feet enable them to walk and run fast even in soft, deep snow. At top speed, they can travel up to 27 miles (43 kilometers) per hour! Salmon and trout are strong and speedy swimmers thanks to their streamlined shape and strong tail fins.

BROWN BEARS
Adapted to Thrive from the Mountains to the Sea

• LESSON 4: How do I compare to a bear?

Brown bears have adaptations too! A variety of physical traits give brown bears the strength, power and ability to thrive not only in Katmai but in many other parts of the world as well.

Built to be Big, Brawny and Fast! Standing three to five feet (over one meter) at the shoulder, seven to ten feet (two to three meters) in length and weighing between 600 to over 1,000 pounds (270 to 455 kilograms), an adult male brown bear is one of the largest, most powerful animals in North America. Like other bear species, brown bears have strong, thick legs, a heavily built body, a large head and they walk with their feet turned inward. While they may look a little clumsy, don't be fooled! A brown bear can run as fast as a horse at 30-35 miles per hour (48-56 kilometers per hour) over short distances. At that speed, Usain Bolt, the world's fastest human clocked at 28 miles (45 kilometers) per hour, would be outrun by a brown bear!

A Camouflaged Coat: Brown bears are brown, right? Not always! A brown bear's coat ranges from blonde to almost black and every shade in between. This camouflage coloration helps them hide from predators and sneak up on prey. Brown bears that live in the interior of North America are known as grizzlies because their brown fur is tipped with white, silver or tan; the word grizzly means "grey-haired."

Fur and Fat for Food and Warmth: Brown bears have a thick coat of coarse protective guard hairs and soft underfur that keeps them warm in winter and protects them from insects in the spring and summer. A layer of stored fat provides additional insulation and food reserves for the winter – a season where brown bears can lose up to 40 percent of their body weight.

A Mass of Muscle: Brown bears have a large, distinctive hump of muscle between their shoulders. This muscle mass gives them extra power to dig and strike with their front paws.

Strong Claws and Big Paws: Massive, curved, claws measuring four inches (10 centimeters) long are perfect tools for catching salmon, digging up roots and small rodents, tearing apart logs for grubs and excavating winter dens. Broad, flat paws have thick pads for protection and traction. At nine to twelve inches (23-31 centimeters) long and five to seven inches (13-18 centimeters) wide, their flat hind paws are almost as big as dinner plates! While animals like dogs and cats walk on their toes, bears walk on the soles of their feet like we do.

Varied Teeth for a Varied Diet: Brown bears are **omnivores** meaning they eat both plants and animals. Their varied tooth structure reflects this omnivorous diet. Pointed canines and sharp jagged incisors in the front of their mouth help brown bears grab, kill and eat other animals. Long, flat molars in the back help them grind fruit, grasses, seeds and plant materials (a bear's molars look similar to ours). With their powerful teeth, massive skull and strong jaw muscles, bears can crunch through a deer's leg in a single bite. Thanks to their flexible lips they can extract tiny pine seeds, munch small berries right off the bush, scoop grubs from logs and delicately extract fish eggs from riverbeds.

A Super Sense of Smell: A brown bear's hearing and vision are believed to be similar to ours. Their night vision is enhanced by a reflective lining along the back of their eyeball that bounces light back through the retina. It's a bear's sense of smell that really sets

them apart! A bear's sense of smell is seven times better than a bloodhound's and 2,100 times better than ours! The secret to this super sniffing ability? A bear's olfactory bulb (the area of the brain that manages smell) is at least five times larger than ours and their vast nasal cavity, structured like a honeycomb, is lined with millions of scent receptors. These adaptations allow a bear to sniff out food, cubs, a mate or danger up to two miles (three kilometers) away! Because of their reliance on smell, bears use scent to communicate with other bears. Cubs learn the scent of their mother and adult bears use their scent to announce their presence in an area or their interest in a mate.

GROWING UP BROWN BEAR

• LESSON 7: How do brown bear cubs grow and learn?

Newborns: Starting Life in the Safety of the Den

Bear cubs are born in January and February. They are hairless, helpless and the size of a small chipmunk! Cubs spend their first few months **nursing** (drinking milk produced by their mother) and growing in the warmth and safety of their underground **den**. Due to the high fat content of their mother's milk (about 33 percent), cubs gain weight quickly. Weighing only one pound (one-half of a kilogram) at birth, they usually weigh 15-25 pounds (7-11 kilograms) by the time mother and cubs emerge in mid–spring. Cubs continue to nurse through their first summer and fall. They supplement their milk diet with solid foods introduced by their mother. By the time they re-enter the den the following winter, cubs will weigh around 100 pounds (45 kilograms)!

The First Two Years: A Time to Watch and Learn

Every day is a school day for bear cubs! While many species rely mostly on instinct, brown bears are taught survival skills. These are called **learned behaviors**. Most lessons are learned as cubs observe and imitate their mother. Tasting and locating foods, navigating and memorizing favorite trails, avoiding predators, climbing trees, fishing and swimming are just part of a cub's daily "curriculum." Unfortunately, some cubs also learn to forage at dump sites, steal fish from anglers or take "play" items like coolers from porches and boats. These activities bring them close to humans and can get them into trouble as adults.

Despite their mother's care, instruction and fierce protection, this is a dangerous time for cubs. Drowning, falling, getting

lost and encountering predators like wolves and male brown bears, all pose threats to cubs. In Katmai, as many as two-thirds of the brown bear cubs born each year fail to survive to the following winter.

Cubs remain in their mother's care for up to two and a half years (and sometimes longer if food is limited). During this time, cubs form strong but temporary bonds with their mother and siblings. Male bears do not have a role in raising cubs and can even be a threat. To avoid this risk, mothers and cubs separate once the female becomes ready to breed and begins attracting mates. Because females typically stop having cubs at around age 20, they will only have four or five litters in their lifetime.

Sub-Adults: Surviving at the Bottom of the Bear Hierarchy

Sub-adult brown bears are independent of their mothers but not old enough to mate. These are difficult years for bears as they learn to fit in amongst a complex world. Small, gangly and on the lowest level of the bear hierarchy, sub-adults are forced to yield food, space and preferred fishing spots to bigger, stronger adults. They may even face attacks by other bears. Despite the dangers, sub-adults are curious and playful. They are often seen chasing ducks, play-fighting or awkwardly practicing their fishing skills. Brown bears reach adulthood between six and eight years of age. However females may not have their first litter of cubs until several years later.

BEAR TALK

Communicating Through Sounds, Scents, Scratches and Stomps

- LESSON 2: How much space do brown bears need to survive?
- LESSON 7: How do brown bear cubs grow and learn?

Like dogs and cats, brown bears use vocalizations, body language and scent-marking to express their emotions and communicate with each other.

Vocalizations: Despite the loud growls you hear on TV, bears are much more likely to grunt, cry, huff or even purr. Common bear vocalizations include:

- **Sociable sounds** like grunts and tongue clicks are used by bears seeking friendly contact; for instance, a mother communicating with her cubs or a bear approaching another to mate or play. Cubs make a motor-like purr when they nurse. Adults will sometimes make a similar sound when they are especially comfortable and secure or when eating a favorite food.
- **Apprehensive sounds** include forceful expulsions of air accompanied by threatening body language. While this looks and sounds very threatening, it is usually harmless bluster from a nervous bear, often a female with cubs.
- **High emotional sounds** communicate pain, pleasure, anxiety and fear. Bears huff and clack their teeth when they are afraid or startled. Woofs, huffs and snorts warn of a possible attack. Growls, jaw popping and teeth clicking may indicate that an attack is imminent.

Body Language: Brown bears also communicate through their posture, ear position and eye contact. For instance, a curious bear will stand on its hind legs to gain a better view. An angry bear may lower its head, stare and flatten its ears.

A threatened bear may snap its teeth, rush forward (bluff charge) and slap the ground or a nearby object. Sitting down, standing sideways, yawning or looking away in the presence of another bear are signs of respect. The submissive bear is saying "I don't want any trouble." These ritual threats and displays provide bears with a safe alternative to fighting which could lead to injury or even death.

Scent Marking: Scent marking on plants is a way for solitary brown bears to safely broadcast their location, status and identification. These smelly advertisements allow males to find mates while avoiding other males. To leave these scent-filled messages, bears rub against trees, straddle small shrubs and saplings, arch their backs against overhanging branches and even stomp their feet.

Stomp Walking: Stomp-walking is a form of scent-marking. Bears stomp, twist and slide their feet as they walk, leaving behind scents from glands on their feet. These scents are used to mark frequently traveled trails, dens and favorite trees. Like other bear species, brown bears tend to walk in their own tracks, so an area that is frequented by bears is easily identified by the trail of sunken footprints beaten into the forest floor.

Tree Scratching and Biting: Brown bears also communicate through scratching and biting trees, sign posts and utility poles. The majority of these marks are left by mature males during the mating season, but males and females of all ages will leave these marks behind as well. Like scent marking, scientists believe the bites and scratches help bears advertise their location, find mates and reduce conflicts. These marking locations are usually found near dens or along frequently used trails.

BROWN BEAR RESEARCH
Saving Bears through Scientific Study

- LESSON 8: How do scientists use footprints to study bears?
- LESSON 9: What methods do scientists use to study brown bear populations worldwide?

Research Challenges and Benefits

Scientific research is the first step towards protecting any species. Identifying and understanding brown bear populations, natural behaviors, daily activities and travel patterns help land managers and governments determine habitat needs, make effective land use decisions, address human-bear conflict issues and identify reasons for brown bear decline.

Learning Which Bear is Which

The annual gathering of bears at the Brooks River in Katmai National Park offers scientists a unique opportunity to observe brown bears up-close, but it also presents a distinct challenge. How do you tell so many brown bears apart? Fortunately, like people, no two bears are alike. Each bear has distinct characteristics that distinguish it from other bears. These include size, hair color, face, ear and body shape, shed patterns and claw color. Many also have distinctive scars and wounds. Scientists record these features in photographs, videotapes and field notes. Behavioral traits, preferred fishing spots and individual fishing techniques are also recorded and tracked from season to season and year to year.

Learning about Bears by what They Leave Behind

As bears travel across the landscape they leave behind evidence like **footprints**, rubs, trails, hair, scat, claw marks, bite marks, digs, wallows, beds, food caches and dens. These signs help scientists identify travel routes, monitor populations and provide valuable insight into a bear's daily life. Like fingerprints, each bears' footprints are unique. Scientists use footprints as bear identification tools.

Technology to the Rescue

Studying brown bears isn't easy! In Katmai National Park, scientists use footprints and personal observations to study bear populations. But in many other parts of the world, brown bears are remote, solitary, far-ranging and potentially dangerous – making them incredibly difficult to track and observe up-close. Fortunately, bear scientists worldwide have a variety of additional technological tools to help them identify, track and monitor brown bears safely from a distance.

Tools of the Trade: Tracking Brown Bear Travel Patterns through Radio Signals and GPS

Radio collars are commonly used to monitor the movement of brown bears and other wildlife. Once activated, the collars emit a signal at a unique, assigned frequency. **Global positioning satellite** (GPS) technology uses a system of satellites to record and transmit a specific location on Earth. By collecting GPS data points, scientists can map a bear's home range, track travel patterns and monitor habitat use. This information is required to make informed bear management and land use decisions.

Tracking DNA by Studying Hair and Scat

Genetic technology allows scientists to identify individual bears by extracting DNA from hair and droppings (**scat**). Hair is caught and collected from **hair snares** – strands of barbed wire strung on or near favorite scratching trees. The snares catch hairs as the bears pass by or stop to scratch. Bears are sometimes lured closer to these hair snares with a smelly brew of rotten fish. Once the hair is collected, the DNA is extracted and analyzed in a lab. DNA can also be extracted from bear scat located with the help of specially trained "sniffer" dogs. Since every bear has a different genetic code, DNA technology allows scientists to safely and easily identify individual bears including gender and genetic connections.

Catching Bears on Camera

Motion-sensored cameras or **camera traps** take pictures or video when they sense movement. Like radio collars and hair samples, they allow scientists to safely study bears and other wildlife from a distance. When placed near feeding sites and travel routes they help scientists identify travel patterns, behaviors, habitat use and population densities (the number of animals found in an area).

CURRENT CONSERVATION STATUS AND FUTURE THREATS

Good and Bad News for Brown Bears

- LESSON 10: How can I safely visit bear country?
- LESSON 11: How can people live safely with brown bears?

Bears Bouncing Back

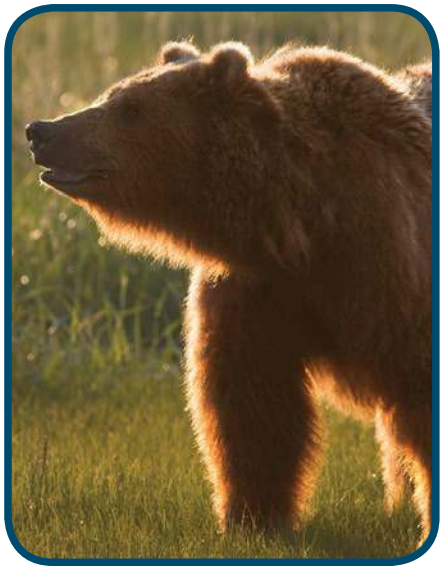
In 1975, due to dramatic declines in both numbers and habitat, brown bears in the lower 48 states were listed as a threatened species under the Federal Endangered Species Act. A threatened species is defined as "likely to become endangered (in danger of extinction) within a significant portion of its range." Today, thanks to protection, research, habitat management and the brown bears' natural ability to adapt to changing habitats and food sources, brown bear numbers and distribution are stable and even increasing in some parts of the United States. Brown bear recovery efforts

have been so successful in and around Yellowstone National Park that this specific population was recently removed from the Endangered Species List. Globally, brown bear numbers remain relatively large and stable. While some small, isolated groups are threatened, other protected populations are growing and expanding their range.

Facing an Uncertain Future

But it's not all good news for brown bears. Habitat destruction, fear, illegal hunting for bear parts, and the need for open space and high-energy foods continue to make life challenging for this amazing and complex creature. Brown bears also face new threats. Warming temperatures, non-native species, illegal fishing, hydroelectric dams and pesticides are reducing critical food staples including cutthroat trout, salmon, white bark seeds, army cutworm moths and "winter kill" carrion. These fish, seeds and grubs provide the calories and protein needed to build winter fat reserves. "Winter kill" carrion is an essential energy source for bears when they emerge from hibernation and are too groggy to hunt.

However, the biggest threat to brown bears today is increased **human-bear conflict**. When people log, mine, farm or construct homes, roads, and **developments** (communities) in and around brown bear habitat, bears are pushed into closer contact with humans. When natural food sources shrink or disappear, bears are easily lured to gardens, birdfeeders, livestock, garbage cans and other human sources of food. As they feed they may destroy crops, beehives and gardens, damage property, threaten pets and young livestock and endanger residents. Eventually they can lose their fear of people, putting both bears and humans at risk. Sadly, these "nuisance bears" are usually killed, removed or hit by cars during their travels. Expanding roads and communities can also **fragment** habitats isolating bears from important food sources and future mates. This prevents the genetic interchange between bear populations that is needed for their long-term survival. Development in valley bottoms and along streams is particularly harmful since brown bears use these as travel **corridors** to search for food and mates. Some private landowners and companies are helping brown bears by protecting these natural "wildlife highways."



Creative Solutions: Creating a Sustainable Future for People and Bears

Fortunately **scientists**, agencies, organizations and concerned individuals are developing ways that people and bears can peacefully co-exist. These solutions integrate the needs and behaviors of both bears and humans and address the root causes of bear-human conflicts. They include education, awareness, compensating farmers and ranchers for property damaged by bears, avoiding negative encounters by removing attractants (these are items that bears find enticing like garbage, pet food and bird seed) and adding physical barriers like electric fencing and bear-proof containers. Some communities are creating a negative environment for nuisance bears by using rubber bullets and specially trained dogs to keep bears away. Studying bears through scientific research, protecting bear habitats and maintaining natural travel corridors are other ways that people are creating a brighter future for brown bears.

Disneynature
BEARS
Celebrate Earth Day 2014 · In Theatres April 18

STAYING SAFE IN BEAR COUNTRY

- LESSON 10: How can I safely visit bear country?
- LESSON 11: How can people live safely with brown bears?

Observing a bear during a camping or hiking trip is an amazing experience. But bear awareness isn't just about spotting these magnificent creatures. It's about protecting them – and you – by acting safely. Keep at least 300 feet away from any bear you see. Never approach, or get between, a bear and her cubs. Remember, bears can run 30-35 miles per hour (48-56 kilometers per hour) and can quickly go from being "far away" to "way too close" in just an instant.

Each year, bears are killed by bird seed, orchard apples, pet food and garbage. How? These and other human food sources lure bears closer to people, roads and communities and increase the risk of human-bear conflict. Once bears become conditioned to these human handouts it is extremely difficult, and sometimes impossible, to retrain them.

Whether you live in bear country or are simply visiting, the following steps help keep you and brown bears safe:

- **Reduce attractants.** Keeping your home free of attractants (items that bears find enticing) is the most important step you can take to make your home "bear- friendly."
- **Follow the rules of the Park.** Camp only in designated sites.
- **Keep food, pet food, and garbage in bear-proof containers.**
- **Reduce tempting smells** by washing barbeque grills, portable smokers, ice chests and coolers. Store scented items (like toothpaste, lotion, sun screen and bug repellent) well away from your campsite, hanging out of reach (at least 10 feet or three meters above the ground) or in a bear-proof container.
- **Keep pets safe.** Never feed pets outside at dawn or dusk when bears are most active. Pick up food bowls as soon as your pet is finished. Never leave bowls unattended. At night bring in food and water bowls and keep pets inside.
- **Don't leave food or garbage in your car.** Just a trace of food on a paper plate or a drop of soda pop can entice a bear to pry open a door or window.
- **Pick fruit and garden crops as soon as they ripen.** Clean up fallen fruit.
- **Don't let your bird feeder turn into a bear feeder!** Remove bird feeders during months when bears are active. Instead use water features, native plants, nest boxes and flowers to attract birds.
- **Add barriers.** If you live in bear country, adding electric fencing, platforms and bear-proof containers will discourage bears from accessing tempting foods.
- **Add electric fencing around beehives, gardens, orchards and livestock pens.** Locate them away from your house and away from natural bear cover. Harvest fruit and garden crops as soon as they ripen.
- **Travel corridors.** Work with your community and wildlife authorities to create travel corridors for bears or protect existing ones. These "wildlife highways" provide cover for bears moving from feeding sites to their den. Located away from people's homes and camp sites, they reduce conflict interactions between people and wildlife.

1 Where do brown bears live?

GRADE LEVEL
2-6

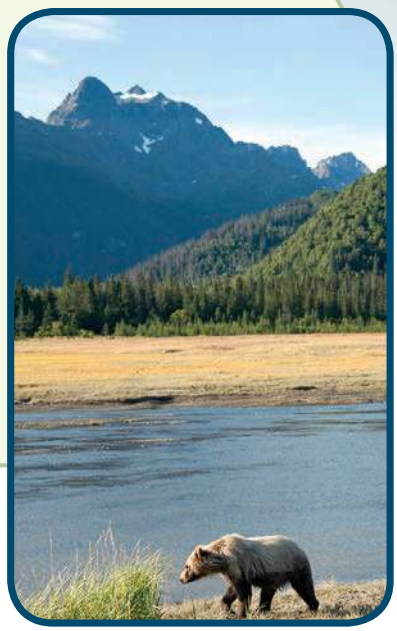
SUBJECT AREAS
Art
Language Arts
Math
Science
Social Studies

BACKGROUND INFORMATION
Pages 8-12

VOCABULARY: Ecosystem, habitat, range, sedge

STUDENTS WILL BE ABLE TO...
- Define and compare the terms ecosystem, habitat and range
- Identify the current range of the brown bear and locate Katmai National Park on a world map
- Explain why living and non-living parts of the environment are equally important to the survival of brown bears
- Describe at least three brown bear habitat elements and connect these to the ecosystem where they are found
- Predict how a change in habitat can impact brown bear survival

WHAT YOU NEED
- World map or globe
- Activity Sheet 1: Where do brown bears live?
- Activity Cards: Brown Bear Habitat Cards



LEARNING ACTIVITIES

1. Introduce students to the world of the Alaskan brown bear using the movie trailer for Disneynature **BEARS** (available at disney.com/bears). Show students the continents where brown bears are found using a world map or globe and the International Union for the Conservation of Nature (IUCN) range map: http://maps.iucnredlist.org/map.html?id=41688. Discuss the current and historic **range** of the brown bear as a class.
2. Disneynature **BEARS** was filmed in Katmai National Park, Alaska. Locate Alaska and the relative area of Katmai National Park on a world map or globe. Introduce students to Katmai National Park using the park's website featuring a park map, photo gallery and visitor information (http://www.nps.gov/katm/index.htm). Discuss the size and features of Katmai National Park.
3. Introduce the term **ecosystem** and use the Katmai National Park website to identify at least three different ecosystems in Katmai National Park. Discuss the importance of both living and non-living parts of an ecosystem. What living elements might brown bears need to survive? *Brown bears depend on plants and animals for food.* What non-living elements might brown bears need to survive? *Students should conclude that sunlight, wind, water, soil, oxygen, temperature and weather are all important to the brown bears' survival.*
4. Discuss how an ecosystem differs from a **habitat**. What examples of brown bear habitat elements (food, water and cover) do students see in the Disneynature **BEARS** trailer (preview the movie trailer a second time if needed)? Have students use the Brown Bear Habitat Cards to complete Activity Sheet 1. Students should determine which habitat elements belong in each of the three ecosystems.

FOREST = den • puddle • berries
SEDGE MEADOW = sedge • lake • snowshoe hare
RIVER ECOSYSTEM = river bank • river • salmon

5. After completing Activity Sheet 1, compare the habitat elements found in each ecosystem. How do brown bears depend on these elements to survive? *All habitats must provide food, water and cover for animals to survive. However, the type of food, water and cover changes depending on the ecosystem. In the forest and sedge meadow, food can be berries, nuts, insects or small mammals. But salmon (an important food item in the river ecosystem) would not be found in the forest or sedge meadow. In the same way, sedge might provide cover in the sedge meadow, but not in the forest. Water is an important habitat element that also takes different forms (river, lake or puddle). Students should*

1 Where do brown bears live?

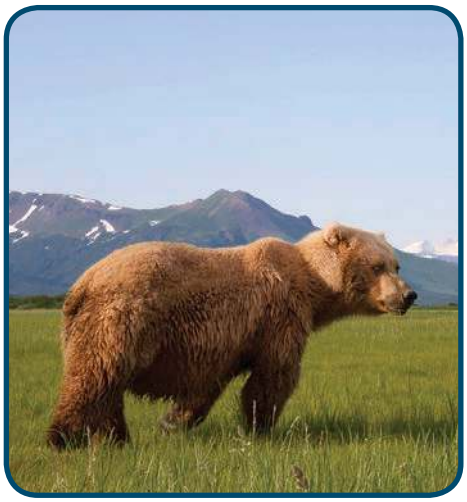
conclude that because brown bears use and travel through multiple ecosystems throughout the year, they depend on different forms of food, water and cover to survive.

6. For students in Grades 4-6: Break the class into small groups. Have each group pick one of the three ecosystems featured in this lesson (forest, sedge meadow and river). Each group should research the following questions about their ecosystem: What other brown bear habitat elements exist in this ecosystem? How might these habitat elements change throughout the year? How might people impact these habitat elements negatively and positively? How do changes in the habitat impact brown bears? Have students share their findings with the class as part of a PowerPoint presentation or poster display.

WRAP UP & CHECK FOR UNDERSTANDING

Wrap up and check for understanding using the following discussion points:

- **Define and compare the terms habitat, ecosystem and range.** *A habitat is the area where an animal finds food, water and cover; many habitats make up an ecosystem. An ecosystem is the arrangement and interactions of all living and non-living parts; more than one ecosystem may be found in an animal's range. A range is the geographic area where an animal population is found.*
- **Explain why living and non-living things are equally important to the survival of brown bears.** *Brown bears depend on their ecosystem, which is made up of both living and non-living parts. Without non-living components, such as sunlight, wind and weather there would be no living components, such as plants to provide food, oxygen or shelter for bears. Living and non-living parts of the ecosystem are intricately connected and brown bears depend on both to survive.*



- **Describe at least three brown bear habitat elements and connect these to the ecosystem where they are found. Predict what would happen if one or more of these things were removed.** *Students should state that the brown bears' habitat provides them with the food, water and cover needed to survive. Students can describe any combination of the following ecosystems and habitat elements: forest = berries (food), puddle (water), den (cover); sedge meadow = snowshoe hare (food), lake (water), sedge (cover); river = salmon (food), river (water), river bank (cover). Because everything is connected, removing even one of these habitat elements could disrupt the entire ecosystem, making it difficult for brown bears to survive.*

EXTENDING THE LESSON

- **LANGUAGE ARTS AND SOCIAL STUDIES:** Have students read part or all of Katmai National Park's newsletter *The Novarupta* (http://www.nps.gov/katm/loader.cfm?csModule=security/getfile&pageid=146715). Break students into small groups and have them choose one or two stories to share with other members of the class. Then, have each group research and create a newsletter or brochure featuring a local, state or national park in your area (http://www.nps.gov/findapark/index.htm). Students should be sure to highlight fun outdoor activities, any historical or cultural connections, recommendations for visiting at different times of the year and unique wildlife viewing opportunities. Students should also include actions people can take when visiting the park to lessen their impact on wildlife (for example, staying on marked trails, following park rules, picking up litter and not feeding wild animals). Have students share their newsletter or brochure with peers, other classes or as part of a larger school symposium.
- **MATH AND SOCIAL STUDIES:** Katmai National Park and Preserve covers over four million acres (6,395 mi^2 or 16,564 km^2)! To discover how large this park actually is, have students overlay a map of Katmai National Park onto a map of your city, county or state. Calculate how many times Katmai National Park could fit into your state, or how many times your city, county or state could fit into Katmai National Park.

1 Where do brown bears live?

RESOURCES

For Students

- Breiter, Matthias. *The Bears of Katmai: Alaska's Famous Brown Bears.* Portland, OR: Graphic Arts Books, 2000.
- McHugh, Erin. *National Park: A Kid's Guide to America's Parks, Landmarks and Monuments*. New York, NY: Black Dog & Leventhal Publishers, 2012.
- National Geographic Kids. *National Geographic Kids: National Park Guide, U.S.A.* Washington, DC: National Geographic Children's Books, 2012.
- Orr, Tamra B. *Alaska*. New York, NY: Scholastic Library Publishing, 2008.
- Somervill, Barbara A. Alaska. Children's Press (Scholastic Library Publishing), 2008.

For Teachers

- Alaska Geographic/Bear Necessities Coalition. *Ballad of the Wild Bear*. http://www.alaskageographic.org/uploads/pdf/teaching_guide.pdf
- America's State Parks/ParksbyNature Network. *America's State Parks Pocket Ranger® Passport*. http://pocketranger.com/
- Florida Fish and Wildlife Commission. *Black Bear Necessities*. http://myfwc.com/media/150726/Bear_lesson1.pdf
- Idaho Department of Fish and Game/Idaho ProjectWILD. *How many bears can live in this forest?* http://idahoptv.org/dialogue4kids/season7/bears/howmanybears.cfm
- Idaho Department of Fish and Game/Idaho ProjectWILD. *What bear goes where?* http://idahoptv.org/dialogue4kids/season7/bears/beargoeswhere.cfm
- International Union for the Conservation of Nature (IUCN). *IUCN Red List: Ursus arctos*. http://www.iucnredlist.org/details/41688/0
- National Park Service. *Coastal Salt Marshes.* http://www.nps.gov/lacl/naturescience/coastal-salt-marshes.htm
- National Park Service. *Katmai National Park.* http://www.nps.gov/katm/index.htm
- National Park Service. *Lake Clark National Park & Preserve.* http://www.nps.gov/lacl/naturescience/
- North American Bear Center. *The Black Bear Shuffle.* http://www.bear.org/website/images/stories/education-outreach/lesson-plans/Black_Bear_Shuffle.pdf

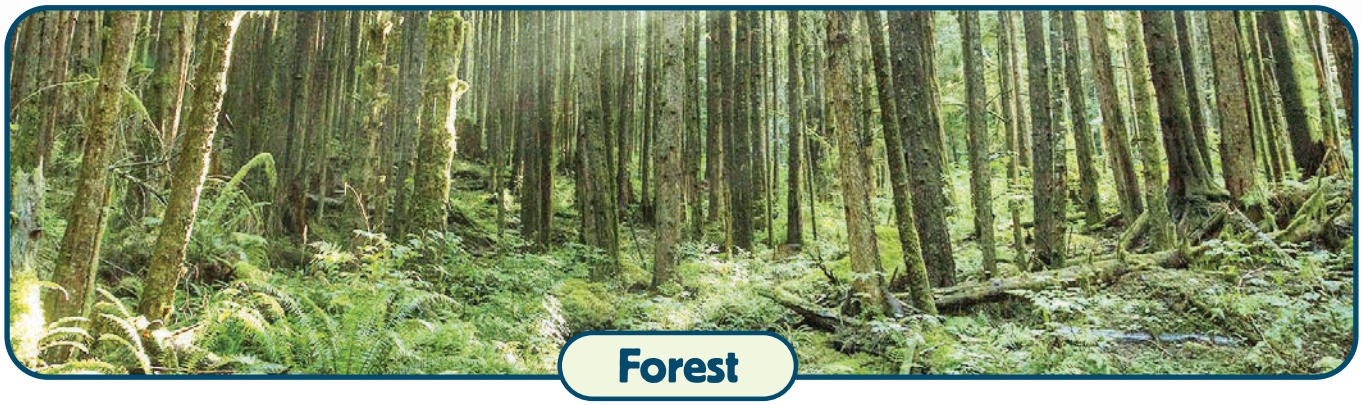
CONNECT WITH NATURE

To learn more about wildlife habitats and ecosystems in your area, plan a class field trip to explore a local, state or national park! Give students local field guides, a nature journal and a digital camera to document their trip.

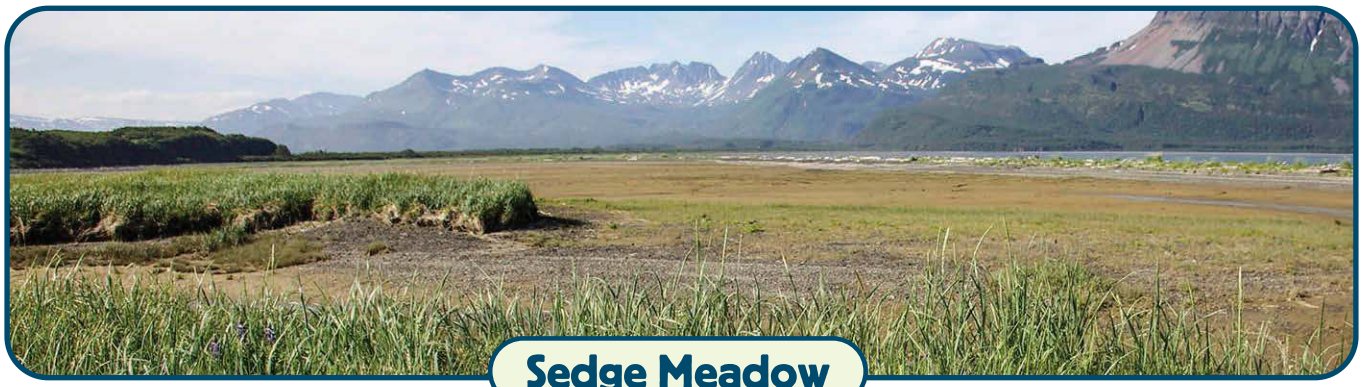
Download the **America's State Parks Pocket Ranger® Passport** app (**http://pocketranger.com/**) to help plan your visit and discover fun ways for your students to explore the great outdoors!

Where Do Brown Bears Live?

DIRECTIONS: Place one food, one water and one cover card into each ecosystem below to learn where brown bears live and the habitat elements they need to survive.



Forest



Sedge Meadow

River

CONNECT WITH NATURE | Visit a local, state or national park to learn more about plants, animals and wildlife habitats near you!

Where Do Brown Bears Live? Activity Cards

Cut out and place the Brown Bear Habitat Cards into the ecosystems on Activity Sheet 1 to see where bears live and how bears depend on different forms of food, water and cover to survive.

COVER

Den

River Bank

Sedge

WATER

River

Lake

Puddle

FOOD

Snowshoe Hare

Berries

Salmon

CONNECT WITH NATURE | Visit a local, state or national park to learn more about plants, animals and wildlife habitats near you!

Where Do Brown Bears Live?

DIRECTIONS: Place one food, one water and one cover card into each ecosystem below to learn where brown bears live and the habitat elements they need to survive.

CONNECT WITH NATURE | Visit a local, state or national park to learn more about plants, animals and wildlife habitats near you!

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

2 How much space do brown bears need to survive?

GRADE LEVEL
4-6
•
SUBJECT AREAS
Geography
Math
Science
•
BACKGROUND INFORMATION
Pages 8-12, 16

VOCABULARY: Den, ecosystem, forest, home range, sedge meadow, river, scent-marking, species, territory, tree-scratching

STUDENTS WILL BE ABLE TO...
- Define the terms home range, territory and ecosystem
- Compare and contrast the home ranges of people and brown bears
- Determine how much space a brown bear in Katmai National Park needs to survive
- Compare the range of a brown bear living in Katmai National Park to a brown bear living in Yellowstone National Park

WHAT YOU NEED
- Activity Sheet 1: How much space does a brown bear need to survive?
- Activity Sheet 2: Comparing Home Range Size
- Ruler with metric units for each student

LEARNING ACTIVITIES

1. Ask students to share where they spend their time in a typical week: Where do they find food? Explain that just like people, animals need to travel in search of resources to survive. Introduce the term **home range** as the space or area in which an animal lives and travels.
2. Identify a brown bear home range by reviewing the **ecosystems** and bear behaviors presented in the background information and Lesson 1. Where does a brown bear sleep? *Brown bears sleep in their dens during the winter. During the spring, summer and fall, bears sleep in a safe place close to their food source.* In spring, summer and fall, where does a brown bear go during the day and why? *Brown bears visit forest, sedge meadow, and river in search of food such as berries, nuts, plants and meat. In the summer, brown bears living in Katmai National Park head to Brooks River to feed on salmon.*
3. Introduce the term **territory** and discuss how territory differs from home range (a territory is an area that an animal defends and protects). Ask students to predict what areas could be considered a brown bear's territory? *A brown bear's territory could include its den and a favorite fishing spot along the river. Because these places are important to the bear's survival, they will protect and defend these spots from other bears. It's important to note, though, that, when food is very abundant, bears tend to become less territorial because there is less competition for resources.*
4. Explain that because bears are mostly solitary and would rather avoid other bears, they use verbal and non-verbal communication to mark the boundaries of their territory. Use the background information to discuss **scent marking** and **tree scratching** as methods that bears use to communicate with each other.
5. Distribute a ruler and Activity Sheet 1 to each student. Have students complete the activity and estimate the average home range for a brown bear living in Katmai National Park. Discuss findings as a class: What four locations do bears travel to in their home range? *The **den, sedge meadow, forest** and **river.*** How big is the average home range of a brown bear in Katmai National Park? *Katmai brown bears have an average home range of about 10 square miles (25 square kilometers).*
6. Distribute Activity Sheet 2 to each student. Have students complete the activity to compare the average home range sizes of brown bears living in Katmai National Park with those living in Yellowstone National Park. Who has a bigger home range? *The Katmai National Park brown bears have an average home range of about 10 square miles (25*

How much space do brown bears need to survive?

square kilometers), and the brown bears living in Yellowstone National Park have an average home range of about 250 square miles (650 square kilometers). Why are they so different? Discuss the ecosystem of each bear species. *Brown bears living near Brooks River in Katmai National Park are dependent on salmon fishing for their primary food source, so they need to have a small home range close to the river. Each of the ecosystems frequently visited by the brown bears in Katmai has ample food sources (i.e. berries and plant material in the forest and sedge meadow), so it's not necessary for the bears to travel far. Brown bears in Yellowstone do not have the abundant source of salmon each summer, so they travel far distances to feed on items like elk, bison, rodents, berries, and many other plant materials.*

WRAP UP & CHECK FOR UNDERSTANDING

- **Define home range. What ecosystems comprise a brown bear's home range in Katmai National Park?** *An animal's home range is the space or area in which it lives and travels. For a brown bear living in Katmai National Park, it travels through three ecosystems: the forest, sedge meadow and river.*
- **Describe the difference between a home range and a territory. What conditions make an animal territorial? How will a brown bear mark its territory?** *A home range is the area of space in which an animal lives and travels. A territory is the area an animal defends from intruders and other competition. Brown bears are not naturally territorial but they often have overlapping home ranges. Because bears travel through their home range in search of food, water or shelter, they can become territorial when in competition for resources. Brown bears will mark their territory with techniques such as scent-marking and tree-scratching to avoid competition with other bears.*
- **What is the most important factor that determines an animal's home range? What other factors influence an animal's home range?** *The determining factor for an animal's home range is food availability. Brown bears living in Katmai National Park have a smaller home range because there is an abundance of food available relatively close to their den site (i.e. salmon fishing). Additionally, plant material is close by in the forest and the sedge meadow. Brown bears living in Yellowstone National Park have a larger home range because their food sources are more widespread, and they don't have a specific feeding area they return to every year. Other important factors that determine an animal's home range include shelter areas and water sources. Animals depend on food, water and shelter for survival so they are naturally the determining factors in their home range.*
- **What would happen to the brown bear population if a highway was constructed through their home range?** *The construction of a highway could fragment their habitat, limiting the amount of space that brown bears have to find food, water and cover. In fact, bears that are restricted to only one area may not find enough food to build up fat reserves for the winter, making it difficult to survive. Over time, a reduction in space and resources would cause the bear population to decrease. For more information on this topic and how people can make a difference for brown bears, refer to Lesson 11.*

EXTENDING THE LESSON

- **SCIENCE:** Encourage the class to observe animals that live in your area and try to determine a home range for the animal. Then, create a footprint tube to study small animals living near your school! Secure a long strip of paper, covered with a layer of waxed paper inside a piece of PVC piping about 45 cm (18 inches) long and 7 ¾ centimeters (3 inches) in diameter. Add nontoxic ink to the waxed paper just before placing the tube in a nearby garden or planter overnight. As a class, check the tube the next morning and use local wildlife field guides to identify the footprints you collected as small animals traveled through the tube. What animals are living near your school? What are the pros and cons to this sampling method? How else might you study animals in your area? Discuss students' thoughts and findings as a class. To increase your sample size and to gain a better understanding of wildlife in your area, you may also choose to create multiple footprint tubes and place them in a variety of places around the schoolyard.
- **SOCIAL STUDIES AND MUSIC:** Despite the large territories of brown bears, bears and people have lived in shared spaces for hundreds of years. As a result, bears play an important role in many Native American cultures. Discuss with students the importance of bears in certain Native American cultures, making some of the following points: the bear is respected because it

2 How much space do brown bears need to survive?

represents power and courage; a mother bear is very protective of her cubs; Native Americans believe the bear spirit can protect them; many different Native American tribes perform dances to honor bears. Some examples include:

- http://www.youtube.com/watch?v=tyaRMyZwmBc
- http://www.youtube.com/watch?v=CHW7E6KOwNQ
- http://www.youtube.com/watch?v=ywKiAIU2_oo
- http://www.youtube.com/watch?v=IvJawuJqlOI

After watching the videos, discuss with students the different movements made by the dancers and how the music (drums and signing) is coordinated with the dancing. Tell the children that they will be organizing and performing a Bear Dance based on the native Alutiiq people who live near the Alaskan brown bears featured in Disneynature **BEARS**. First, help students make an instrument that is typical of the Alutiiq people (for resources, visit: http://alutiiqmuseum.org/exhibits/exhibits-on-line/271-alutiit-cauyait-alutiiq-peoples-music.html and http://alutiiqmuseum.org/files/Ed%20Handouts/30%20Drum.pdf) using empty corn meal, oatmeal or salt containers cut into 3-inch rings. Clear packing or masking tape can be placed across the top of the containers to make a drumhead. Unsharpened pencils and paper towels work well for drumsticks and yarn, crayons, glue and construction paper can be used to decorate the drum. Next, help the children create a "bear song" using the following Allutiq words for a chant: "Naama taquka'aq, Naama taquka'aq?" Pronounced "nah-ma tah-koo-kak" this translates to "Where is the bear, Where is the bear?" Once students can chant the words, add drumming to accompany the chant with a steady beat pattern such as those played in the sample bear dance videos. Finally, help the children perform the dance. Let some of the children act as drummers while others sing and dance in a circle. As they chant, the children should be encouraged to move around in a circle making dance

movements that imitate the movements they saw bears make in the movie or trailer. At the end of four repetitions of the chant, have the children face the outside of the circle and roar or growl like a bear. Then repeat the chant. Have drummers switch places with the singers and dancers so all children can participate.

RESOURCES

For Students

- National Geographic. Katmai National Park. http://travel.nationalgeographic.com/travel/national-parks/katmai-national-park/
- Yellowstone National Park. Bear Characteristics. http://www.nps.gov/yell/naturescience/bearchar.htm

For Teachers

- Katmai National Park. Map of Katmai. http://go.nps.gov/katmai_maps
- National Park Service. *Bears of Brooks River: A Photographic Guide to the lives of Katmai's Brown Bears*. http://go.nps.gov/katmai_ebooks
- North American Bear Center. *The Black Bear Shuffle*. http://www.bear.org/website/lesson-plans/lesson-plans-alpha-list.html
- Yellowstone National Park. The Bears of Yellowstone. http://www.windowsintowonderland.org/bears/index.htm

CONNECT WITH NATURE

TAKE A FIELD TRIP to a local state, community, or national park near your school. Before visiting, gather field guides of animals that students may see. Have students record which animals they see.

After visiting, discuss the different wildlife they saw and how the field guides helped to identify wildlife. Have students select one animal to research. Have students predict whether the animal has a large or small home range based on the type of the ecosystem observed during the field trip. Students may draw a map of the animal's home range within the ecosystem.

How Much Space Does A Brown Bear Need to Survive?

Scientists observe brown bears to learn about their behavior. Read the field notes written by the scientist observing a brown bear in Katmai National Park. Use a ruler to measure the distance between each study site. Calculate the brown bear's home range using the map scale.

Study Site 1

Scientists observed an adult brown bear emerging from the winter ***den***. It appears to be alone.

How far to Study Site 2?
_____ km

Study Site 2

Tree scratches found while observing brown bears in the ***forest***.

How far to Study Site 3?
_____ km

Study Site 3

Brown bear seen fishing for salmon at Brooks River.

Brown bear seems to get majority of food from the ***river***.

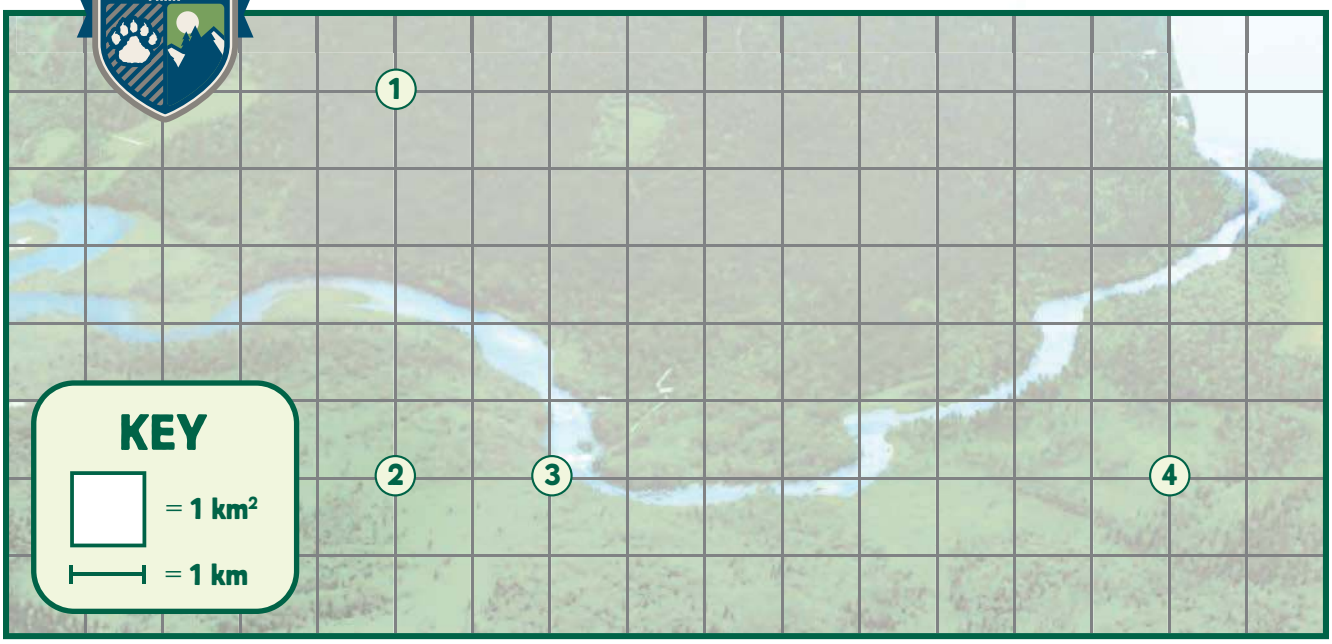
How far to Study Site 4?
_____ km

Study Site 4

Bears seen resting for the night in a ***sedge meadow*** near the Brooks River.

The bear returned to the river in the morning.

How far to Study Site 1?
_____ km



Using the key on the map, calculate the area of the brown bear's home range.

Average brown bear home range: _____ km²

CONNECT WITH NATURE | Visit a national, state or community park near your home. Make sure to pick up a field guide before you look for animals.

How Much Space Does A Brown Bear Need to Survive?

Scientists observe brown bears to learn about their behavior. Read the field notes written by the scientist observing a brown bear in Katmai National Park. Use a ruler to measure the distance between each study site. Calculate the brown bear's home range using the map scale.

Study Site 1

Scientists observed an adult brown bear emerging from the winter ***den***. It appears to be alone.

How far to Study Site 2?
5 km

Study Site 2

Tree scratches found while observing brown bears in the ***forest***.

How far to Study Site 3?
2 km

Study Site 3

Brown bear seen fishing for salmon at Brooks River.

Brown bear seems to get majority of food from the ***river***.

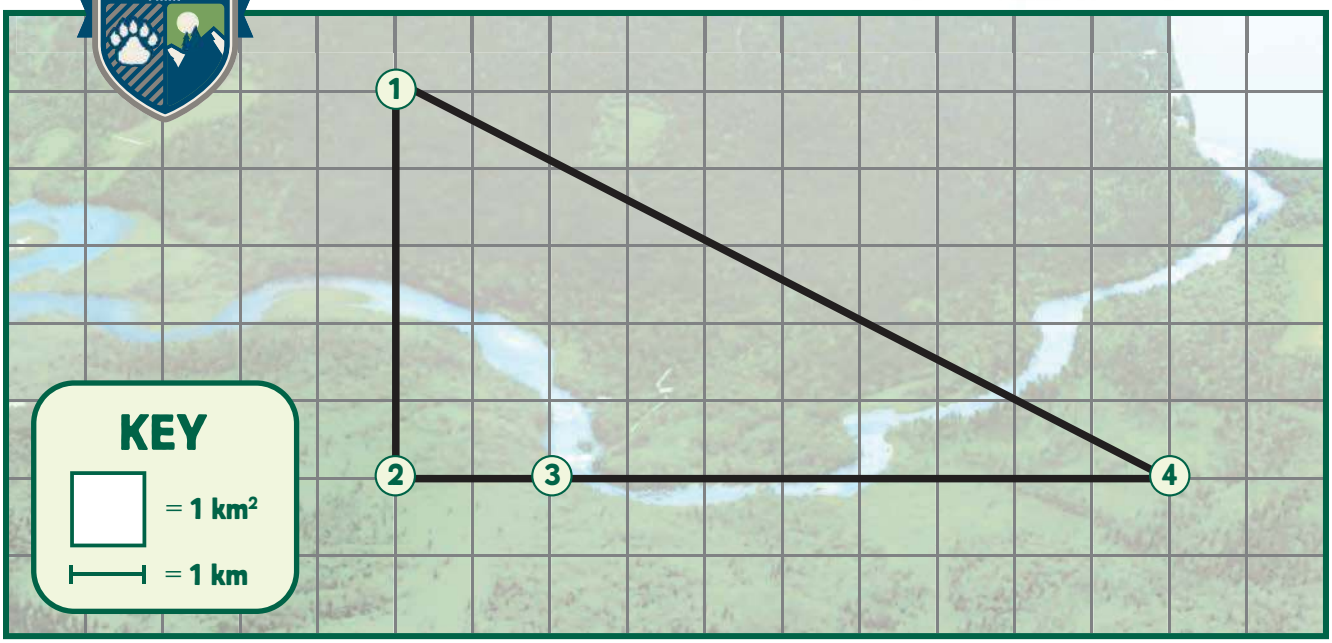
How far to Study Site 4?
8 km

Study Site 4

Bears seen resting for the night in a ***sedge meadow*** near the Brooks River.

The bear returned to the river in the morning.

How far to Study Site 1?
11.2 km



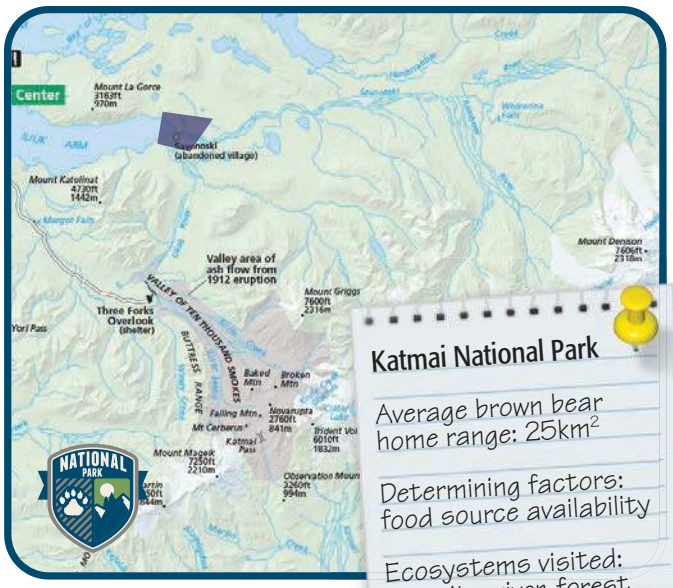
Using the key on the map, calculate the area of the brown bear's home range.

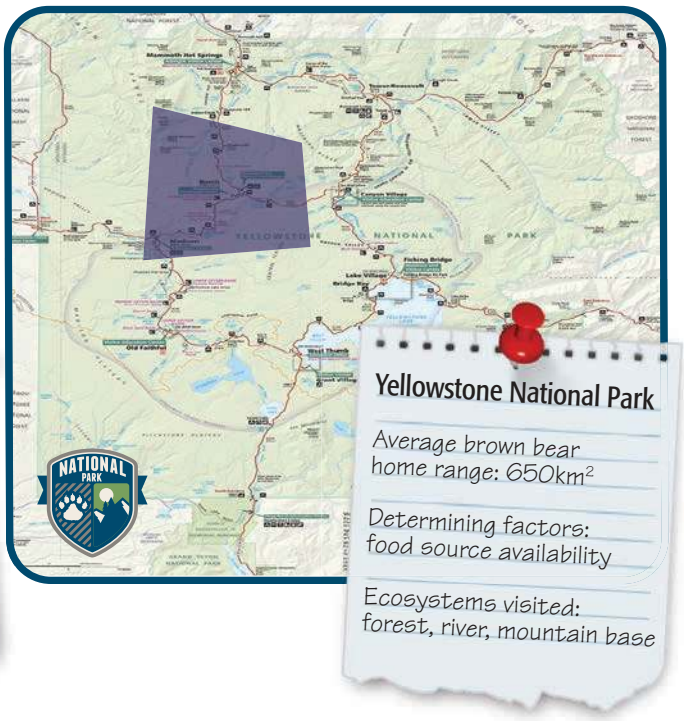
Average brown bear home range: 25 km²

CONNECT WITH NATURE | Visit a national, state or community park near your home. Make sure to pick up a field guide before you look for animals.

Comparing Home Range Size

Brown Bear Home Range: The size of a brown bear's home range can be different depending on where they live. An average home range of a brown bear has been identified in purple on each map. Look at the maps of Katmai National Park and Yellowstone National Park and answer the questions below.





Identify the home range of a brown bear living in each park.

Yellowstone National Park is much larger than Katmai National Park. What park has the larger brown bear home range? Predict why. _____

_____

_____

What determining factors do the brown bears share? Predict how this effects the bears in each park differently.

_____

_____

CONNECT WITH NATURE | Visit a national, state or community park near your home. Make sure to pick up a field guide before you look for animals.

3 Who are a brown bear's neighbors?

GRADE LEVEL
2-6
•
SUBJECT AREAS
Art
Language Arts
Math
Science
Social Studies
•
BACKGROUND INFORMATION
Pages 10-12

VOCABULARY: adaptation, biodiversity, camouflage, decomposer, forage, herd, niche, predator, pack

STUDENTS WILL BE ABLE TO...
- Explain and apply the term biodiversity, niche and adaptation in their own words
- Identify at least two animal niches within Katmai National Park
- Describe at least three examples of animal adaptations
- Compare and discuss how animals' adaptations differ depending on their niche and ecosystem

WHAT YOU NEED
- Activity Sheet 1: Animal Cut-Outs (Grade 2-6)
- Activity Sheet 2: Brown Bear Neighbors Animal Poems (Grade 2-6)
- Activity Sheet 3: Who are a brown bear's neighbors? (Grade 2-6)
- 10 craft (popsicle) sticks
- Tape

LEARNING ACTIVITIES

1. Show students images of Katmai National Park from the Disneynature BEARS image gallery (disney.com/bears). Ask students to predict what kind of animals may interact with brown bears in this space: what animals might live in the water, mountains, sky and forest?
2. Introduce the term **biodiversity** as the different types of life forms found in an area and the interactions between them. What examples of biodiversity can students identify among the brown bear animal neighbors that live in Katmai? Explain that there are many kinds of living organisms and each has their own role or **niche**.
3. Prior to the lesson, cut out the animals from Activity Sheet 1 (optional: using a copier or scanner, increase the size of each animal cut-out for a larger visual) and the poems from Activity Sheet 2. Distribute one copy of Activity Sheet 3 to each student. Divide the class into ten groups. Distribute one craft stick, one animal and one corresponding animal poem to each group. Explain that each animal shares space with brown bears. Have students tape or glue their animal to the craft stick to use as a puppet. Then, ask students to decide as a group how to act out their animal's poem.
4. Use a projector or print an image of Katmai National Park and display this at the front of the class as a backdrop. Have each group present their poem. The rest of the class should follow along and fill in the blanks on Activity Sheet 3. After each group presents their poem, have students tape their animal on the Katmai background to show where it spends most of its time.
5. Introduce the term **adaptation** (for older grades, you may also choose to discuss that adaptations are expressed through changes in genotypes and phenotypes over thousands of years). Review and compare the adaptations of brown bear neighbors, including **camouflage** coloration, being able to jump or run fast, having sharp teeth or claws, and the benefits of living in a **herd** or **pack**. Discuss how animals are alike and different, and how their adaptations help each animal fulfill its niche in the environment.
6. Discuss the different types of niches found in Katmai National Park. Introduce the terms **predator** and **decomposer** and discuss their importance in an ecosystem. Students should conclude that many animals are also food for other animals, which is equally important. In a balanced ecosystem, all animals depend upon each other to survive.

3 Who are a brown bear's neighbors?

WRAP UP & CHECK FOR UNDERSTANDING

Use the following questions to wrap up the lesson and check for understanding:

- **Explain the term biodiversity in your own words. Why is biodiversity important to an ecosystem?** *Biodiversity is the variety of life forms found in an area and the interactions between them. An ecosystem with a variety of life forms (a lot of biodiversity) is healthy because it means there are enough resources (food, water, cover, nutrients, sunlight, soil, minerals, etc.) to support a wide variety of life.*
- **Define the term niche and identify at least two examples of animal niches found within Katmai National Park.** *Every animal has a role, or niche, within Katmai National Park. Here are some examples of the roles different animals play within the park: salmon, snowshoe hare, porcupine, Dall's sheep and caribou are all examples of food sources; flies are decomposers; wolves, foxes, bald eagles and otters are all predators; porcupines help spread nuts and replant the forest.*
- **Define the term adaptation. Compare the adaptations of at least three brown bear neighbors and describe how these adaptations help them fulfill their niche in their ecosystem.** *An adaptation is a trait that allows an animal to survive in its environment. Without adaptations, organisms would have difficulty finding food, water and shelter, and may not be able to escape predators or defend themselves. The brown bears' neighbors have a variety of adaptations including camouflage, sharp talons, specialized hooves, a strong sense of smell, a strong sense of hearing, the ability to fly, swim or lay eggs. These adaptations also help each animal fulfill their niche in the ecosystem. For example, as predators both eagles and foxes are well adapted for catching prey, but their adaptations are different. Eagles have long talons and can fly, an adaptation that allows them to swoop down and grab prey. Foxes hunt for prey at night, using their large ears to hear and sharp teeth to catch prey. Wolves and caribou both live in groups; however, there are different benefits to group life for each. For caribou, living in a herd means they are better protected from predators because large numbers of animals reduces their chances of getting caught. Fish live in a very different ecosystem than porcupines, so their adaptations are different. Fish can swim and during specific seasons they lay large quantities of protein-rich eggs; they also have the ability to breathe underwater. Porcupines are adapted for climbing trees in the forest, so they have long claws, special gripping footpads and thousands of quills for protection.*

EXTENDING THE LESSON

• **ART:** Gather toy replicas or plush animals of Alaskan wildlife for students to use as models to create clay sculptures of their favorite brown bear neighbor. Have students write a few sentences to describe the animal's adaptations and to explain how they captured these adaptations in their sculpture. Display students' sculptures as part of a classroom exhibit or create a larger diorama by having students create a three dimensional reproduction of Katmai National Park and place their sculptures into the scene.

• **ART AND MUSIC**: Set the completed poem from Activity Sheet 3 to music using a familiar children's tune of your choosing. Give students time to learn the song as a class and record them singing. Have each student create a mask of one of the brown bear neighbors using a paper plate, markers and string. Finally, play back the recorded song and have students create a "Brown Bear Neighbors Celebration" by dancing around the room, wearing their masks and moving around like the animal they represent.

3 Who are a brown bear's neighbors?

- **LANGUAGE ARTS:** Have students pick a favorite brown bear neighbor featured in this lesson. Students should research the animal to learn about it in more detail (helpful websites include http://www.arkive.org and http://animaldiversity.ummz.umich.edu/). Then, have students write, illustrate and share their own poem or short story about their favorite brown bear neighbor with the class.
- **SOCIAL STUDIES:** Ask students to think about who and what makes up their community: who are their neighbors? What are the different roles (jobs), talents and skill sets needed to ensure a community survives? What locations around the community do people visit most often and how do people interact in these locations? What would happen if certain roles, such as police officers, plumbers, firemen, doctors, sanitation workers and teachers were removed? What if grocery stores, parks, hospitals, schools and places of worship were removed? You may also choose to have students look at how communities in North America have changed over time: how were things alike and different 100 years ago? 200 years ago? 500 years ago? Have students create and perform a street play to demonstrate the different roles of people within a community from one of these time frames or the present day.

RESOURCES

For Students

- Arkive. http://www.arkive.org/
- Ewing, S. *Lucky Hares and Itchy Bears*. Portland, OR: Alaska Northwest Books, 2001.
- Follet, C.B. *Grrrr: A Collection of Poems About Bears*. Berkely, CA: Arctos Press, 2000.
- Kallen, Stuart A. *Alaskan Brown Bears*. Edina, MN: Abdo & Daughters , 1998.
- National Park Service. Alaskan Animal Adaptations. http://www.nps.gov/bela/forkids/alaskan-animal-adaptations.htm
- National Park Service. *Animals of Katmai National Park*. http://www.nps.gov/katm/naturescience/animals.htm
- National Park Service. *Our Wild Neighbors*. http://www.alaskacenters.gov/our-wild-neighbors.cfm
- National Park Service. *Wildlife in Lake Clark National Park & Preserve.* http://www.nps.gov/media/photo/gallery.htm?id=235C4258-1DD8-B71C-07F96530DB0271B2
- University of Michigan: Museum of Zoology. *Animal Diversity Web*. http://animaldiversity.ummz.umich.edu/

For Teachers

- North American Bear Center. *Bear Poetry*. http://www.bear.org/website/images/stories/education-outreach/lesson-plans/Bear_Poetry.pdf
- North American Bear Center. *Interactive Panoramas.* http://www.nps.gov/lacl/photosmultimedia/interactive-panoramas.htm

CONNECT WITH NATURE

Encourage students to **CHECK OUT A LOCAL FIELD GUIDE** from the library and take it outside to explore the diversity of life around their home, school or community. Have students record the many different plants and animals they see by writing in a nature journal, drawing or taking pictures.

With permission, students can even upload their wildlife photos to a citizen science website such as **SciSpy** (**http://scispy.discovery.com**), **Project Noah** (**http://www.projectnoah.org**) or **Journey North** (**http://www.learner.org/jnorth**) to help scientists learn more about the animals and plants living around the world!

Animal Cut-Outs

Disneynature
BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Brown Bear Neighbors Animal Poems

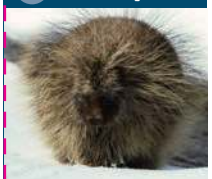
Cut out the animal poems below and distribute to each group along with the corresponding animal cut-out. Have each group use the word bank to fill in the blanks with the appropriate terms identifying the ecosystem(s), niche(s) and adaptation(s) for their animal. Some wrong terms are included.

1 White-tailed Deer

Although the _____ (ecosystem) is a great place to hide, I am _____ (niche) for wolves and bears. So to warn other deer, I stomp my _____ (adaptation) and wave my _____ _____ (adaptation adaptation) to say "Danger is near!"

tail food white antlers hooves forest

2 Porcupine



My long _____ (adaptation) and special _____ (adaptation) allow me to climb _____ (ecosystem) trees. I drop down nuts along the way helping to _____ (niche) _____ (niche).

claws seed forest feet spread wings

3 Wolf

I live in a _____ (adaptation) known as a _____ (adaptation) and together, we hunt and scavenge. As a top _____ (niche) in the _____ (ecosystem) I keep all others _____ (niche).

pack meadow pod balanced group predator

4 Caribou

My sense of _____ (adaptation) and special _____ (adaptation) help me travel the _____ (ecosystem) in the snow. Although I can be _____ (niche) for wolves and bears, my _____ (adaptation) offers protection as I grow.

quills food smell hooves herd meadow

5 Snowshoe Hare

My _____ (adaptation) provides great _____ (adaptation). Blending in to _____ (ecosystem) snow and grasses. Because I'm _____ (niche) for many things I try to _____ (adaptation) and _____ (adaptation) the fastest.

camoflauge leap meadow food fur jump drive

6 Red Fox

I'm a night time _____ (niche) with large _____ (adaptation) to hear my prey. A _____ (ecosystem) in the _____ (ecosystem) is where I hide and sleep during the day.

meadow den tent ears predator nose

7 Fly

My two clear _____ (adaptation) carry me in search of rotting meat. But as a _____ (niche), I help keep the _____ (ecosystem) neat.

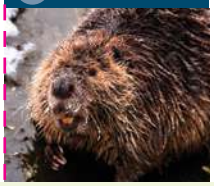
meadow savanna tails decomposer wings

8 Bald Eagle

Perched high up in the tree tops I look for prey along the _____ (ecosystem). Long _____ (adaptation) help me to grab fish. As a _____ (niche), I catch my dinner.

talons predator fingers desert river

9 Beaver



I'm famous for the _____ (niche) I build. My sharp _____ (adaptation) can cut through trees. My job is to _____ (niche) down rushing _____ (ecosystem) and in turn, that keeps the water _____ (niche).

teeth river dirty clean slow dams

10 Salmon

I am _____ (adaptation) up the _____ (ecosystem) to lay _____ (adaptation) where I began. I am also _____ (niche) for other creatures, from bears to birds to humans.

trees swimming eggs dancing food river

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Who Are A Brown Bear's Neighbors?

DIRECTIONS: Follow along as your classmates help tell the story of Amber and Scout's Journey through Katmai National Park. Fill in the blanks too discover the adaptations, niche and ecosystem of each of their neighbors.

Hi!

We are little brown bear cubs, and this is our first journey.
As we travel through our home we constantly are learning.
Come along and join with us, our tale you'll help deliver
as we move through Katmai Park, from our den to the river.

1 White-Tailed Deer

The first animal we meet is...

Although the _____ (ecosystem) is a great place to hide, I am _____ (niche) for wolves and bears. So to warn other deer, I stomp my _____ (adaptation) and wave my _____ _____ (adaptation adaptation) to say "Danger is near!"

2 Porcupine

The second animal we meet is...

My long _____ (adaptation) and special _____ (adaptation) allow me to climb _____ (ecosystem) trees. I drop down nuts along the way helping to _____ (niche) _____ (niche).

3 Wolf

The third animal we meet is...

I live in a _____ (adaptation) known as a _____ (adaptation) and together, we hunt and scavenge. As a top _____ (niche) in the _____ (ecosystem) I keep all others _____ (niche).

4 Caribou

The fourth animal we meet is...

My sense of _____ (adaptation) and special _____ (adaptation) help me travel the _____ (ecosystem) in the snow. Although I can be _____ (niche) for wolves and bears, my _____ (adaptation) offers protection as I grow.

5 Snowshoe Hare

The fifth animal we meet is...

My _____ (adaptation) provides great _____ (adaptation). Blending in to _____ (ecosystem) snow and grasses. Because I'm _____ (niche) for many things I try to _____ (adaptation) and _____ (adaptation) the fastest.

6 Red Fox

The sixth animal we meet is...

I'm a night time _____ (niche) with large _____ (adaptation) to hear my prey. A _____ (ecosystem) in the _____ (ecosystem) is where I hide and sleep during the day.

7 Fly

The seventh animal we meet is...

My two clear _____ (adaptation) carry me in search of rotting meat. But as a _____ (niche), I help keep the _____ (ecosystem) neat.

8 Bald Eagle

The eighth animal we meet is...

Perched high up in the tree tops I look for prey along the _____ (ecosystem). Long _____ (adaptation) help me to grab fish. As a _____ (niche), I catch my dinner.

9 Beaver

The ninth animal we meet is...

I'm famous for the _____ (niche) I build. My sharp _____ (adaptation) can cut through trees. My job is to _____ (niche) down rushing _____ (ecosystem) and in turn, that keeps the water _____ (niche).

10 Salmon

The tenth animal we meet is...

I am _____ (adaptation) up the _____ (ecosystem) to lay _____ (adaptation) where I began. I am also _____ (niche) for other creatures, from bears to birds to humans.

At last we're here, we made it safe, and all along the way, we learned about our neighbors – what an exciting day!
Thanks for traveling along with us, it really was such fun! But now we have to learn from Mom as she catches salmon in the run!

CONNECT WITH NATURE | Use a local field guide to explore your backyard or a park near your home! Learn more about your plant and animal neighbors.

Who Are A Brown Bear's Neighbors?

DIRECTIONS: Follow along as your classmates help tell the story of Amber and Scout's Journey through Katmai National Park. Fill in the blanks too discover the adaptations, niche and ecosystem of each of their neighbors.

Hi!

We are little brown bear cubs, and this is our first journey.
As we travel through our home we constantly are learning.
Come along and join with us, our tale you'll help deliver
as we move through Katmai Park, from our den to the river.

1 White-Tailed Deer

The first animal we meet is...

Although the ___forest___ (ecosystem) is a great place to hide, I am ___food___ (niche) for wolves and bears. So to warn other deer, I stomp my ___hooves___ (adaptation) and wave my ___white tail___ (adaptation adaptation) to say "Danger is near!"

2 Porcupine

The second animal we meet is...

My long ___claws___ (adaptation) and special ___feet___ (adaptation) allow me to climb ___forest___ (ecosystem) trees. I drop down nuts along the way helping to ___spread___ (niche) ___seeds___ (niche).

3 Wolf

The third animal we meet is...

I live in a ___group___ (adaptation) known as a ___pack___ (adaptation) and together, we hunt and scavenge. As a top ___predator___ (niche) in the ___sedge meadow___ (ecosystem) I keep all others ___balance___ (niche).

4 Caribou

The fourth animal we meet is...

My sense of ___smell___ (adaptation) and special ___hooves___ (adaptation) help me travel the ___sedge meadow___ (ecosystem) in the snow. Although I can be ___food___ (niche) for wolves and bears, my ___herd___ (adaptation) offers protection as I grow.

5 Snowshoe Hare

The fifth animal we meet is...

My ___fur___ (adaptation) provides great ___camoflauge___ (adaptation). Blending in to ___sedge meadow___ (ecosystem) snow and grasses. Because I'm ___food___ (niche) for many things I try to ___jump___ (adaptation) and ___leap___ (adaptation) the fastest.

6 Red Fox

The sixth animal we meet is...

I'm a night time ___predator___ (niche) with large ___ears___ (adaptation) to hear my prey. A ___den___ (ecosystem) in the ___sedge meadow___ (ecosystem) is where I hide and sleep during the day.

7 Fly

The seventh animal we meet is...

My two clear ___wings___ (adaptation) carry me in search of rotting meat. But as a ___decomposer___ (niche), I help keep the ___sedge meadow___ (ecosystem) neat.

8 Bald Eagle

The eighth animal we meet is...

Perched high up in the tree tops I look for prey along the ___river___ (ecosystem). Long ___talons___ (adaptation) help me to grab fish. As a ___predator___ (niche), I catch my dinner.

9 Beaver

The ninth animal we meet is...

I'm famous for the ___dams___ (niche) I build. My sharp ___teeth___ (adaptation) can cut through trees. My job is to ___slow___ (niche) down rushing ___rivers___ (ecosystem) and in turn, that keeps the water ___clean___ (niche).

10 Salmon

The tenth animal we meet is...

I am ___swimming___ (adaptation) up the ___river___ (ecosystem) to lay ___eggs___ (adaptation) where I began. I am also ___food___ (niche) for other creatures, from bears to birds to humans.

At last we're here, we made it safe, and all along the way, we learned about our neighbors – what an exciting day!
Thanks for traveling along with us, it really was such fun! But now we have to learn from Mom as she catches salmon in the run!

CONNECT WITH NATURE | Use a local field guide to explore your backyard or a park near your home! Learn more about your plant and animal neighbors.

4 How do I compare to a bear?

GRADE LEVEL
2-6

SUBJECT AREAS
Math
Science

BACKGROUND INFORMATION
Pages 13-14

VOCABULARY: Adaptation, canines, digits, fat layer, forage, hair, incisors, molars, omnivore, paw, teeth

STUDENTS WILL BE ABLE TO...
- Define the term adaptation
- List at least three examples of bear adaptations
- Describe how brown bear adaptations help them survive
- Compare the adaptations of brown bears and people using simple measurements
- Infer how the adaptations of a brown bear are necessary for survival

WHAT YOU NEED
- Bear Adaptations PowerPoint Presentation
- Measuring tape or ruler for measuring
- Activity Sheet 1a-b: How do I compare to a bear?
- Activity Sheet 2: Brown Bear Adaptation Game Board
- Activity Cards: Brown Bear Adaptation Cards
- A playing piece for each student (repurposed game pieces or small items such as plastic bottle caps)
- Number cubes (one for each small group)

LEARNING ACTIVITIES

1. Introduce the term **adaptation**. Watch the movie trailer for Disneynature **BEARS** (disney.com/bears). Discuss the following questions with the students and record their answers for later discussion: What does a bear look like? What adaptations do bears have to help them survive in their environment?
2. Share the *Bear Adaptations* PowerPoint presentation with the class. Discuss the adaptations introduced in the PowerPoint as a class:
   a. **HAIR:** A bear's hair acts as a winter coat during cold weather to keep it warm. Hair also protects brown bears from biting insects during summer heat.
   b. **FAT LAYERS:** Brown bears have a thick layer of fat underneath the fur which insulates them in cold temperatures.
   c. **HEAD:** Brown bears have an average of 42 teeth. Define the term **omnivore**, and discuss why brown bears need different types of teeth for the food they eat. Brown bears have several sharp incisor (front) teeth, long canines for capturing prey and protection against enemies, and broad, flat molars for grinding plant material. A brown bear's skull measures almost 15 inches (38 centimeters) in length. Their long nose contains millions of scent receptors that give them an excellent sense of smell.
   d. **BODY:** Brown bears standing on their hind legs can be almost nine feet tall! They stand on their hind legs to intimidate intruders, mark their territory by tree scratching, and find food. Brown bears have a distinctive shoulder hump; their large muscles make them amazing diggers and give them the power to bring down large prey.
   e. **PAWS:** Brown bears have long paws with five digits and claws. Their claws can grow up to four inches (10 centimeters) long. These long claws help bears to dig, tear-up food items and climb trees.
   f. **SENSE OF SMELL:** Brown bears have an excellent sense of smell used for finding food, locating other bears and identifying intruders. A brown bear can detect a scent up to two miles (over three kilometers) away!
3. Based on the adaptations discussed in the *Bear Adaptations* PowerPoint presentation, have students work in pairs to record their measurements on Activity Sheet 1a. As a class, discuss the similarities and differences between the physical characteristics of bears and people.

4 How do I compare to a bear?

4. Discuss the similarities and differences between a bear's paw print and the student's hand print on Activity Sheet 1b. Students should note the difference between the size, nail length and structure of their hand compared to a brown bear's paw. How many digits does a bear paw have? As a class, discuss how bears use their claws to forage for and capture various types of food.
5. Next, gather students into small groups of three to five students to play the Brown Bear Adaptations Game using Activity Sheet 2 and the Activity Cards. The purpose of the game is to collect different adaptations to build a complete bear. The first student to collect all six adaptations and reach the Bear Den in the center of the game board has won the game.

6. By playing the game, students will explore a variety of adaptations that help brown bears survive in their habitat including hair, fat layers, teeth, head, paws and sense of smell.
   - Make enough game sets for each small group of students. Each set should include a game board, a set of pre-cut adaptation cards, a playing piece for each student (can be repurposed game pieces or small items such as plastic bottle caps) and a number cube.
   - Students may pick any square in the circle to start the game. Students will take turns rolling the number cube to move along the board. Each board color represents a different brown bear adaptation. In order to acquire that adaptation they must correctly answer a corresponding question on an Adaptation Card.
   - Students continue to travel through the board until they have collected all the Adaptation Cards. If a student rolls the dice and lands on an adaptation they have already collected, they skip that turn. Note: Students can travel forwards or backwards on the game board to more efficiently collect their adaptations.
   - Once the student has collected all six Adaptation Cards, they can begin to move their game piece towards the center of the board towards the Bear Den. The first student to collect all six adaptations and successfully reach the Bear Den wins the game.

WRAP UP & CHECK FOR UNDERSTANDING

Wrap up and check for understanding using the following discussion points:

- **Define the term adaptation in your own words and explain why an adaptation is important for survival.** *An adaptation is a trait that allows an animal to survive in its environment. Without adaptations, organisms would have difficulty finding food, water and shelter, and may not be able to escape predators or defend themselves. Ultimately, without adaptations, an organism may not be able to survive in its environment.*
- **List six examples of brown bear adaptations and describe how these adaptations help a bear survive.** *Bears have many different adaptations for survival. Students should be able to identify the adaptations listed on the activity sheet and explain how they help a brown bear survive. Adaptations could include a bear's hair, fat layer, teeth, body, paws and sense of smell.*
- **Compare your measurements to a brown bear. How are people and bears alike and different? In your own words, explain why people and bears need different adaptations.** *Compare bears to people: bears and people both have both have hands, feet and hair but may use them differently. For example, a bear uses its fur for protection against cold temperatures and even from getting sunburned, but people put on protective clothing for the cold or wear sunscreen in the sun. Bears and people have five digits on their paw/hand, but bears have claws and people have fingernails. People have highly flexible hands for performing multiple tasks with ease, some requiring great dexterity and some requiring strength. Bears have highly adapted paws and claws for climbing trees as cubs, digging their dens, protecting themselves from enemies and foraging for food.*

4 How do I compare to a bear?

- **How does a bear paw print compare to your hand print? How much longer were the bears' claws than your fingernails? Using your knowledge of adaptations, explain why bear and human adaptations are different.** *Bears' claws are much longer in size! Their large claws help them to forage for food in their habitat. Bears' claws are also used to dig their den.*

EXTENDING THE LESSON

- **MATH AND SCIENCE:** Project a life-size silhouette of a standing brown bear on the classroom wall. Adult male bears can stand as much as 9 feet tall. Using a large piece of paper or sections of smaller paper that have been connected, trace the image of the bear. Hang the life-size drawing of the bear on the wall and have students compare their heights to that of the bear. After students write their initials by their height lines, have the class discuss how their heights compare to the bear's height. Discuss how height is an important adaptation for the survival of bears and other animals. If time allows have students color or draw a habitat around the bear. Leave the bear image on the classroom wall as a reminder of the size of these great animals.

RESOURCES

For Students

- Alaska Department of Fish and Game. *Yellowstone National Park*. http://www.nps.gov/yell/naturescience/bears.htm
- Arkive. *Brown Bears*. http://www.arkive.org/brown-bear/ursus-arctos/
- Bowen, Betsy. *Tracks in the Wild*. Boston, MA: Little, Brown and Company, 1993.
- Gibbons, Gail. *Grizzly Bears*. New York, NY: Holiday House, 2003.
- Hirschi, Ron. *Our Three Bears*. Honesdale, PA: Boyds Mill Press, 2008.
- National Park Service. Animals of Katmai National Park. http://www.nps.gov/katm/naturescience/animals.htm
- National Park Service. *Our Wild Neighbors*. http://www.alaskacenters.gov/our-wild-neighbors.cfm
- Sartore, Joel. *Face to Face with Grizzlies*. National Geographic Children's Books: Washington DC. 2009.

For Teachers

- Association of Zoos and Aquariums. http://www.aza.org
- Discover Education. *Bears*. http://www.discoveryeducation.com/teachers/free-lesson-plans/bears.cfm
- Florida Fish and Wildlife Commission. *What Makes a Bear?* http://myfwc.com/media/150726/Bear_lesson1.pdf
- Idaho Department of Fish and Wildlife / Idaho ProjectWILD. *Footloose*. http://idahoptv.org/dialogue4kids/season7/bears/footloose.cfm
- Idaho Department of Fish and Wildlife / Idaho ProjectWILD. *How Big?* http://idahoptv.org/dialogue4kids/season7/bears/howbig.cfm
- National Park Service. *Yellowstone National Park*. http://www.nps.gov/yell/naturescience/bears.htm
- North American Bear Center. *A Fat Bear is a Healthy Bear*. http://www.bear.org/website/images/stories/education-outreach/lesson-plans/Fat_Bear_Healthy_Bear.pdf

CONNECT WITH NATURE

TAKE A CLASS TRIP TO A LOCAL AZA-ACCREDITED ZOO OR AQUARIUM to learn more about animal adaptations. Have students choose a favorite animal to observe. Students should take a picture of his/her animal and record any adaptations they observe in a journal. Upon returning to the classroom, use students' pictures and field notes to compare the types of adaptations they observed. Discuss as a class how each organism is adapted to their environment.

Comparing Adaptations

Bears have special adaptations to survive in their environment including their height, fur and claws. Use a ruler or measuring tape to compare yourself to a bear.

1

Bears stand on their hind legs to intimidate intruders and find food. An adult bear can be as tall as 275 centimeters or 9 feet when standing on its hind legs!

Measure your height in centimeters and feet. How tall are you?

_____ cm _____ ft

2

Bears' hair color helps them to blend in with their environment while keeping them warm.

What do you use to keep warm in cold temperatures?

_____.

3

Bears have long claws that help them forage for food. An average bear claw is 7 – 10 centimeters or about 3 – 4 inches!

Measure your thumb fingernail in centimeters and inches. How do they compare to a bear's claw?

_____ cm _____ in

4

An adult male brown bear's skull measures about 40 centimeters or 15 inches in length! An elongated nose gives a bear a strong sense of smell.

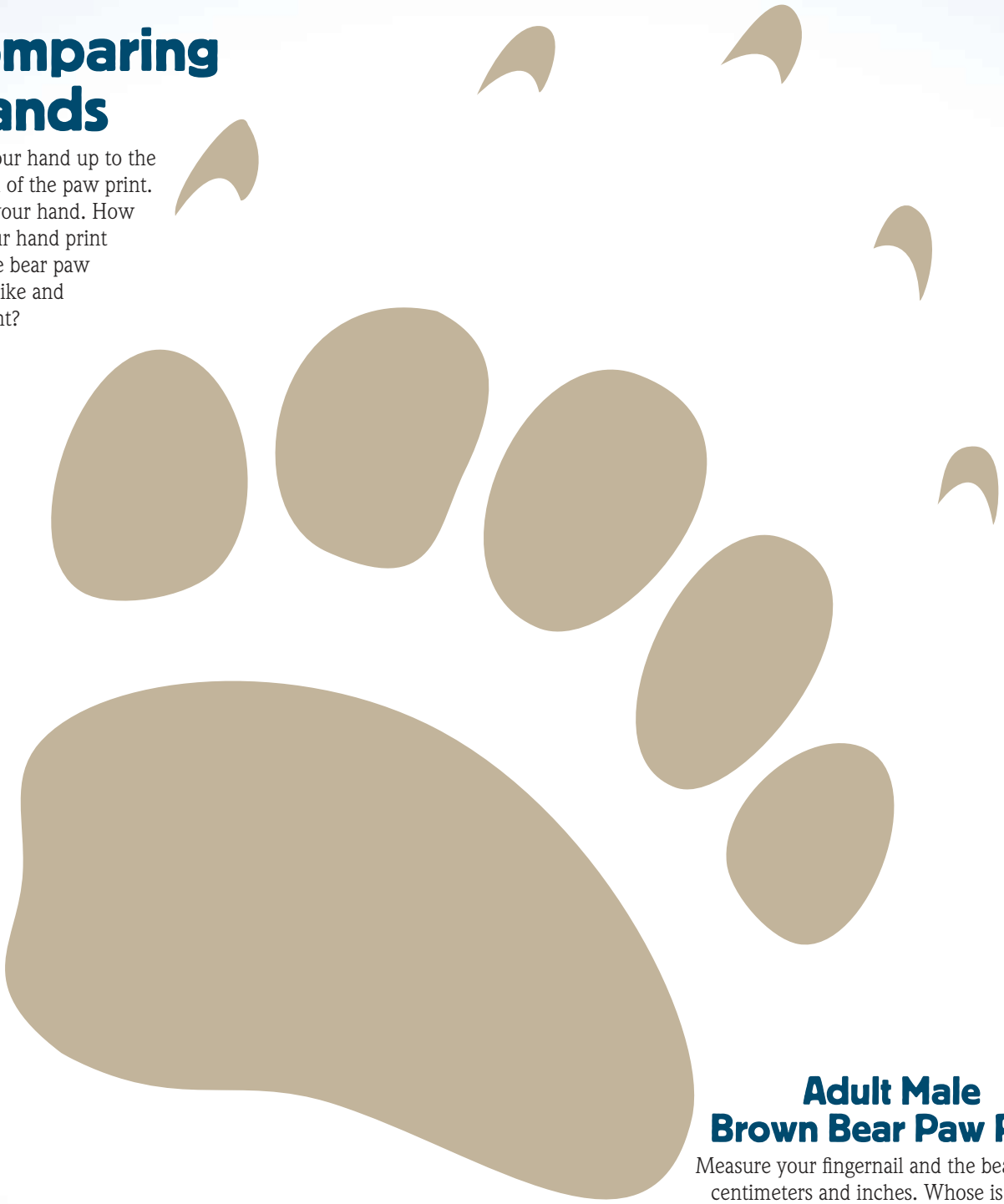
Measure the distance from your nose to the back of your head. How long is it?

_____ cm _____ in

CONNECT WITH NATURE | Visit a local AZA zoo or aquarium to learn more about animal adaptations.

Comparing Hands

Line your hand up to the bottom of the paw print. Trace your hand. How are your hand print and the bear paw print alike and different?



Adult Male Brown Bear Paw Print

Measure your fingernail and the bear claw in centimeters and inches. Whose is longer?

BEAR:_____ cm / _____ in

ME:_____ cm/_____ in

CONNECT WITH NATURE | Look for animal tracks in your backyard to find out what wildlife visits your home.

Brown Bear Adaptation Cards

1 What covers the brown bear's skin and provides it with protection?

a. Feathers
b. Hair
c. Scales

2 Hair protects brown bears from cold temperatures and _____.

a. Insect bites
b. Getting sunburned
c. Both a and b

3 A bear's hair helps it to blend into its environment. What is this called?

a. Mimicry
b. Camoflauge
c. Hiding

1 This keeps a bear's body insulated in cold tempuratures.

a. Mittens
b. Fat layers
c. Bubbles

2 During which season do brown bears build layers of fat?

a. Spring
b. Summer
c. Winter

3 Bears need to eat _____lbs (_____kg) of salmon per day in the summer to build fat.

a. 2 lbs/less than 1 kg
b. 5,000 lbs/2,267 kg
c. 90 lbs/40 kg

1 Brown bears have sharp teeth for eating _____.

a. Ice cream
b. Berries
c. Salmon

2 Brown bears have long, flat molars for eating _____.

a. Salmon
b. Berries
c. Pizza

3 Brown bears have different types of teeth because they eat both plants and meat. This type of animal is called a/an_____.

a. Herbivore
b. Carnivore
c. Omnivore

1 Brown bears stand on their hind legs to_____.

a. Get a better view or a better smell
b. Tree scratch
c. Both a and b

2 What adaptation do brown bears have that give them strong muscles for digging?

a. Nose opening
b. Shoulder hump
c. Sharp teeth

3 A bear's nose is large with wide nostrils. What adaptation does this allow for?

a. A strong sense of smell
b. An excellent sense of hearing
c. Good eyesight

1 How many digits, or fingers, does a bear paw have?

a. 5
b. 4
c. 3

2 How long is the average brown bear claw?

a. 40-80 inches (100-200 cm)
b. 11-19 inches (30-50 cm)
c. 1-4 inches (5-10 cm)

3 What does a young bear use its claws for?

a. To find food
b. To climb trees
c. Both a and b

1 What does a brown bear use its sense of smell for?

a. To find food
b. To find other bears
c. Both a and b

2 A bear can smell scents up to _____ miles away.

a. 50 feet (15 meters)
b. 2 miles (over 3 kilometers)
c. 100 miles (160 Kilometers)

3 What type of food should you bring when visiting bear country?

a. Fish
b. Ice cream
c. Only food that can be stored properly to avoid a bear encounter

Brown Bear Adaptation Cards

1 What covers the brown bear's skin and provides it with protection?
a. Feathers
b. Hair
c. Scales

2 Hair protects brown bears from cold temperatures and _____.
a. Insect bites
b. Getting sunburned
c. Both a and b

3 A bear's hair helps it to blend into its environment. What is this called?
a. Mimicry
b. Camoflauge
c. Hiding

1 This keeps a bear's body insulated in cold tempuratures.
a. Mittens
b. Fat layers
c. Bubbles

2 During which season do brown bears build layers of fat?
a. Spring
b. Summer
c. Winter

3 Bears need to eat _____lbs (_____kg) of salmon per day in the summer to build fat.
a. 2 lbs/less than 1 kg
b. 5,000 lbs/2,267 kg
c. 90 lbs/40 kg

1 Brown bears have sharp teeth for eating _____.
a. Ice cream
b. Berries
c. Salmon

2 Brown bears have long, flat molars for eating _____.
a. Salmon
b. Berries
c. Pizza

3 Brown bears have different types of teeth because they eat both plants and meat. This type of animal is called a/an_____.
a. Herbivore
b. Carnivore
c. Omnivore

1 Brown bears stand on their hind legs to_____.
a. Get a better view or a better smell
b. Tree scratch
c. Both a and b

2 What adaptation do brown bears have that give them strong muscles for digging?
a. Nose opening
b. Shoulder hump
c. Sharp teeth

3 A bear's nose is large with wide nostrils. What adaptation does this allow for?
a. A strong sense of smell
b. An excellent sense of hearing
c. Good eyesight

1 How many digits, or fingers, does a bear paw have?
a. 5
b. 4
c. 3

2 How long is the average brown bear claw?
a. 40-80 inches (100-200 cm)
b. 11-19 inches (30-50 cm)
c. 1-4 inches (5-10 cm)

3 What does a young bear use its claws for?
a. To find food
b. To climb trees
c. Both a and b

1 What does a brown bear use its sense of smell for?
a. To find food
b. To find other bears
c. Both a and b

2 A bear can smell scents up to _____ miles away.
a. 50 feet (15 meters)
b. 2 miles (over 3 kilometers)
c. 100 miles (160 Kilometers)

3 What type of food should you bring when visiting bear country?
a. Fish
b. Ice cream
c. Only food that can be stored properly to avoid a bear encounter

Brown Bear Adaptations Game

Help the brown bear get to its den! Roll a numbered cube to move your game piece through the board. Take the adaptation card that is the same color as the space you landed on. Answer the question correctly to collect your adaptation card. The first to collect all six adaptation cards and successfully reach the bear den is the winner!

CONNECT WITH NATURE | Visit a local AZA zoo or aquarium to learn more about animal adaptations.

5 What do Alaskan animals eat?

GRADE LEVEL
2-6

SUBJECT AREAS
Art
Science
Social Studies

BACKGROUND INFORMATION
Pages 10-12

VOCABULARY: Alpha, carnivore, carrion, consumer, decomposer, ecosystem, energy, fungus, herbivore, niche, predator, prey, producer, scavenger, grass

STUDENTS WILL BE ABLE TO...
- Categorize a variety of Alaskan animals using the terms producer, consumer, decomposer, herbivore, omnivore, carnivore and scavenger
- Classify brown bears as omnivores and top consumers and determine their niche in the ecosystem
- Distinguish similarities and differences between various niches in an Alaskan ecosystem

WHAT YOU NEED
- Outdoor field or large indoor play space
- Glue or tape
- Scissors
- Traffic cones, tape or washable chalk
- Five hula hoops or jump ropes
- Activity Cards: Alaskan Animal Cards
- Activity Sheet 1: What's for dinner?

LEARNING ACTIVITIES

1. Brainstorm a list of foods students think an Alaskan brown bear might eat. Record and save this list for use later in the lesson. Show students clips of brown bears fishing from disney.com/bears and the Live Bear Cam from Brooks Falls in Katmai National Park (www.explore.org/bears). Explain that brown bears in Katmai National Park have learned to fish for one of their favorite foods: sockeye salmon. Although bears' paws are adapted for catching prey, they must learn this fishing behavior from their mothers. Refer to the background information for additional information about the significance of salmon in a brown bear's diet.
2. Take students outdoors to an open space to demonstrate salmon fishing. Using traffic cones, tape or washable chalk, draw two lines lengthwise on the ground to represent Brooks River. The lines of the river can change shape and get narrow to increase the success of the Alpha bear. Place a "start" line at one end to represent the mouth of the river and a "finish" line at the other end to represent Brooks Falls. Gather students into two groups: "bears" and "salmon". There should be many more salmon than bears, so for a class of 30, choose 5 bears and 25 salmon.
3. Give each bear a hula-hoop (or lay the jump rope on the ground to create a circle) to represent their fishing spot. Have salmon wait at the river's mouth (start end of the field). Select the Alpha bear at random or by drawing numbers out of a bag. Since **Alpha** bears have the first choice of the best fishing spots on the river, give the Alpha bear two hula-hoops or a larger rope and allow them to choose their spot first. Then, give others bears 30 seconds to choose their fishing spot along the river. Bears should designate their spot using a hula hoop (jump rope), which cannot be moved during the game. Bears can only tag salmon that come within an arm's reach of their fishing spot (the hoop or rope).
4. Once all bears are in place, have salmon make their way up the "river" while staying in the lines of the river bank and trying to avoid the fishing bears. Any salmon tagged by a bear is considered "caught" and should move to the side behind the bear that caught them. Once the surviving salmon have crossed the finish line and reached the "falls", the game is complete.
5. Discuss the outcome of the game. How many salmon were caught? Did all bears catch at least one salmon? Which bear caught the most salmon? How might the bears adjust their fishing spot in a second round of play? Repeat the game if desired so that multiple students get the chance to become bears.

5 What do Alaskan animals eat?

6. Return to the classroom to investigate what brown bears and their Alaskan animal neighbors eat in more detail. Distribute one set of Alaskan animal cards and Activity Sheet 1 to each group. Assign each group an animal and have them glue or tape that animal to the correct box at the bottom of the page. They should then create a dinner plate for this animal by gluing all of the things this animal eats to the dinner plate.
7. Which organisms make their **energy**? ***Producers,*** *such as moss, plankton and plants make their own energy from the sun (the sun is at the base of almost all food chains in an ecosystem).* Which organisms must get their energy from somewhere else? ***Consumers,*** *which include most of the animals in the food web, must get their energy from eating producers or other consumers.* Introduce and discuss the terms **herbivore**, **omnivore** and **carnivore**. Which organisms might help return nutrients to the environment? ***Scavengers and decomposers,*** *such as flies and* ***fungus,*** *as well as animals that eat* ***carrion,*** *such as wolves and bears, help return nutrients to the environment.* Who are the top consumers or **predators** in this ecosystem? *The top consumers or predators in this environment are the gray wolf, brown bear and bald eagle.* What animals are considered **prey** in this ecosystem? *Students should identify all animals that are eaten by other animals as prey.*

WRAP UP & CHECK FOR UNDERSTANDING

Wrap up and check for understanding using the following discussion points:

- **For 2nd-3rd grade discussion: Compare the initial list of foods that brown bears eat to the brown bear's dinner plate. Add any missing foods to the list. Are brown bears classified as producers or consumers? Are they classified as herbivores, omnivores or carnivores?** *Brown bears are top consumers in their environment, meaning they have no natural predators. They eat a variety of foods, including plants and meat, which makes them omnivores.*
- **For 2nd-3rd grade discussion: How are a brown bear's roles as top consumer and omnivore important? What would happen to the ecosystem if there were not any brown bears?** *As fruit eaters, brown bears help replant trees by spreading seeds in their dung; as predators, they help control other animal populations; by eating carrion, they help keep the ecosystem clean. If there were no brown bears, the ecosystem would not be healthy or balanced.*
- **For 5th-6th grade discussion: Define the terms producer, consumer, decomposer, herbivore, omnivore, carnivore and scavenger in your own words.** *A producer is an organism that makes its own food, while a consumer must eat other organisms for food. A decomposer breaks down old or rotting plants and animals and returns nutrients back into the environment. Herbivores only eat plants, omnivores eat plants and meat, and carnivores only eat meat. A scavenger is an organism that eats dead or decaying plants and animals.*
- **For 5th-6th grade discussion: Categorize the Alaskan animals featured in this lesson using the terms producer, consumer, decomposer, herbivore, omnivore, carnivore and scavenger.**
  - PRODUCERS: *moss, grass, plankton, bark, fruit*
  - CONSUMERS: *bald eagle, beaver, brown bear, caribou, deer, fly, fungus, gray wolf, orb spider, porcupine, red fox, snowshoe hare*
  - DECOMPOSERS: *fly, fungus*
  - HERBIVORES: *beaver, caribou, deer, porcupine*
  - OMNIVORES: *brown bear*
  - CARNIVORES: *bald eagle, gray wolf, orb spider*
  - SCAVENGERS: *bald eagle, brown bear, gray wolf, red fox*

5 What do Alaskan animals eat?

EXTENDING THE LESSON

- **ART, SCIENCE AND SOCIAL STUDIES:** What's on your plate? Have students use polymer clay to create three dimensional plates of food to represent what they eat for breakfast, lunch or a favorite meal. Students should decide whether they are an herbivore, omnivore or carnivore. Display and compare students' plates. Do all people eat the same thing? How do we learn what foods to eat? Where does our food come from? Visit a Farmer's Market or invite a farmer to your class to explore where our food comes from and how people depend on plants and animals to survive.
- **MATH:** Brown bears must eat at least 90 pounds (40 kilograms) of salmon per day to store enough fat to get them through the winter! If an average salmon weighs about eight pounds (three kilograms), how many salmon would a bear need to eat per day? Have students compare this number and weight to the weights of other items around the classroom (textbooks, erasers, pencils, tissue boxes). Students should predict how many of each item it would take to equal 90 pounds (40 kilograms), weigh each item and then calculate this number to test their prediction. Which items would they need more or less of to reach 90 pounds? Is 90 pounds heavier or lighter than they expected? Discuss students' observations and results as a class.

RESOURCES

For Students

- Explore.org. *Brooks Falls: Brown Bear and Salmon Cam*. www.explore.org/bears
- EcoKids. *Chain Reaction: Build the Food Chain!* Earth Day Canada. http://www.ecokids.ca/pub/eco_info/topics/frogs/chain_reaction/play_chainreaction.cfm
- Kid's Corner. *The Food Chain Game*. Sheppard Software. http://www.sheppardsoftware.com/content/animals/kidscorner/games/foodchaingame.htm
- Kolpin, Molly. *Grizzly Bears*. Minneapolis, MN: Capstone Press (Mankato), 2012.

For Teachers

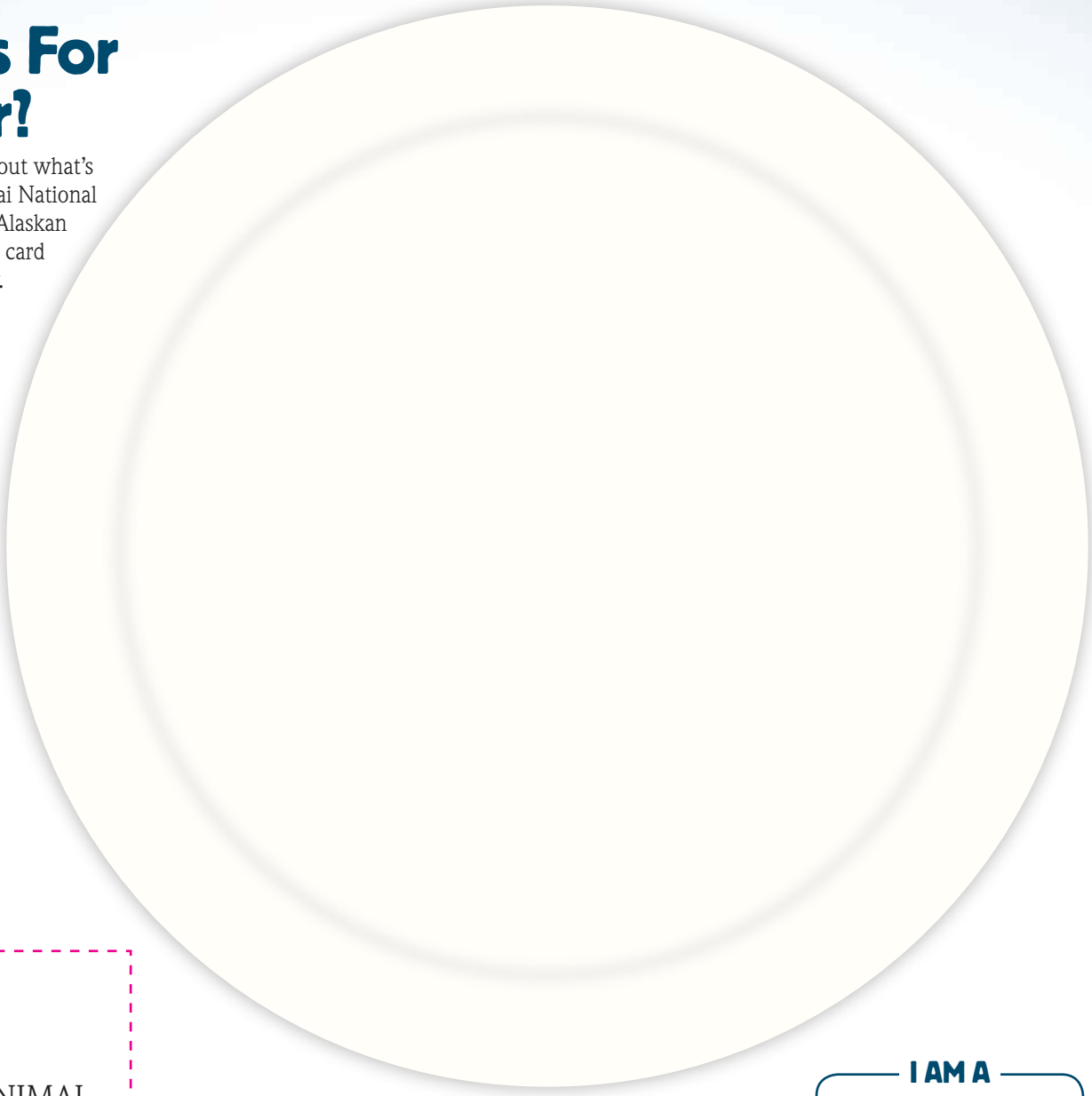
- Idaho Department of Fish and Game/Idaho ProjectWILD. *Year Rings*. http://idahoptv.org/dialogue4kids/season7/bears/yearrings.cfm
- National Park Service. *Bears of Brooks River: A Photographic Guide to the lives of Katmai's Brown Bears*. http://go.nps.gov/katmai_ebooks
- NATURE. *City of Bears: Feasting on the Salmon Run*. PBS. http://www.pbs.org/wnet/nature/lessons/feasting-on-the-salmon-run/enhanced-video-resource/7402/

YOU CAN HELP

ALL ANIMALS NEED CLEAN WATER! As a class, participate in a river, lake or beach clean-up to keep waterways healthy for wildlife everywhere. Visit websites like the National River Cleanup's page **http://www.americanrivers.org/take-action/cleanup/map/** to find opportunities near you!

What's For Dinner?

DIRECTIONS: Find out what's for dinner in Katmai National Park! Choose one Alaskan animal and glue its card into the box below. Using the provided clues, glue the corresponding plant or animal cards onto the plate to show what your animal eats.



PLACE ANIMAL CARD HERE

Based on this plate, check one of the boxes to show whether your animal is a herbivore, omnivore or carnivore.

I AM A

- ☐ HERBIVORE
- ☐ OMNIVORE
- ☐ CARNIVORE

CONNECT WITH NATURE | Organize a river, lake or beach clean-up to keep water habitats clean for fish and the animals that eat fish.

Alaskan Animal Cards

FRUIT

I get my energy from the sun.

SALMON

I get my energy from tiny floating plants and animals called plankton.

MOSS

I get my energy from the sun.

SEDGE

I get my energy from the sun.

RED FOX

I get my energy from fruit, flies and hares.

SNOWSHOE HARE

I get my energy from grass and bark.

FUNGUS

I get my energy from rotting plant material.

Alaskan Animal Cards

PLANKTON

I get my energy from the sun.

GREY WOLF

I get my energy from deer, foxes, hares, porcupine, caribou and carrion.

BEAVER

I get my energy from grass and bark.

WHITE-TAILED DEER

I get my energy from grass, bark and fruit.

PORCUPINE

I get my energy from grass, bark and fruit.

FLY

I get my energy from carrion.

ORB SPIDER

I get my energy from flies.

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Alaskan Animal Cards

CARRION

I am the remains of a dead animal. Many animals eat me.

BALD EAGLE

I get my energy from salmon, hares, beavers, foxes and carrion.

BARK

I get my energy from the sun.

BROWN BEAR

I get my energy from sedge, moss, fruit, flies, fungus, beavers, deer, hares, caribou, foxes, salmon and carrion.

CARIBOU

I get my energy from grass, bark and fungus.

6 How does energy flow through an Alaskan animal food web?

GRADE LEVEL
5-6

SUBJECT AREAS
Science
Math

BACKGROUND INFORMATION
Pages 14-15

VOCABULARY: carnivore, carrion, consumer, decomposer, ecosystem, energy, herbivore, food chain, food web, fungus, omnivore, predator, prey, producer, scavenger

STUDENTS WILL BE ABLE TO...

- Use the terms producer, consumer, decomposer, herbivore, omnivore and carnivore to describe a variety of Alaskan animals
- Describe how a food web differs from a food chain
- Demonstrate how energy flows through an Alaskan ecosystem using a food web
- Predict how changes to the food web can impact an Alaskan ecosystem

WHAT YOU NEED

- Activity Cards: Alaskan Animal Cards (see Lesson 5)
- Activity Sheet 1: How does energy flow through an Alaskan animal food web?
- Whiteboard or flipchart with markers

LEARNING ACTIVITIES

1. As a class, discuss how food gives **energy** to living things. Have students list all of the foods they ate today. Explain that, like us, some organisms are **consumers** and get their energy from eating **producers** or other **consumers**. Other organisms, called producers, make their own energy and **decomposers** and **scavengers** help to return nutrients to the environment.

2. Distribute the Alaskan Animal activity cards from Lesson 5. Have students work individually or in small groups to separate the cards into groups of producers, consumers and decomposers. What group contains the most organisms? *Most of the animals in the food web are consumers.* What kinds of organisms are producers? *Producers include moss, plankton and plants.* Which organisms are decomposers? What other animals help return nutrients to the environment? *Decomposers include flies and **fungus**. Animals that eat **carrion**, such as wolves and bears help return nutrients to the environment.* Who are the top consumers or **predators** in this ecosystem? *The top consumers or predators in this environment are the gray wolf, brown bear and bald eagle.* What animals are considered **prey** in this ecosystem? *Students should identify all animals that are eaten by another animal as prey.*

3. Explain that a **food chain** shows how energy is transferred between organisms within an **ecosystem**. Most food chains begin with the sun. As we move up a food chain from producers to consumers there is less energy available at each level. Decomposers return energy from the food chain back into the environment. As a class, use the plants and animals from the animal cards to create and record food chains. Then, ask students to identify any producers, consumers, scavengers or decomposers in their food chain. Have students also classify the animals in the food chain as herbivores, omnivores or carnivores.

6 How does energy flow through an Alaskan animal food web?

Example food chains include:

FOOD WEB CHAINS

Sun → fruit → brown bear
Sun → moss → brown bear
Sun → plankton → salmon → bald eagle
Sun → bark → beaver → brown bear
Sun → bark → caribou → brown bear
Sun → grass → deer → brown bear
Sun → bark → snowshoe hare → brown bear
Sun → plankton → salmon → brown bear
Sun → bark → beaver → gray wolf
Sun → fruit → deer → gray wolf
Sun → fruit → red fox → brown bear
Sun → grass → snowshoe hare → red fox → bald eagle
Carrion → fly → orb spider → red fox → gray wolf
Rotting plant material → fungi → brown bear
Rotting plant material → fungi → caribou → gray wolf

4. A food web is comprised of many food chains. Distribute Activity Sheet 1 and have students work in groups to complete an Alaskan food web using the completed food chains created in step three. Have students label each level in the food web as producer, consumer or decomposer, and label each organism as an herbivore, omnivore or carnivore. To illustrate how each living thing is connected, remove different organisms from the food web or introduce events that could upset the food web such as floods or fire. Discuss how this would affect other organisms. Students should conclude that every organism in the food web is equally important and depends upon each other for survival.

WRAP UP & CHECK FOR UNDERSTANDING

Wrap up and check for understanding using the following discussion points:

- **List at least three producers, three consumers and one decomposer found in an Alaskan animal food web. Create a supporting statement for why each of these roles is important to the ecosystem.** *Producers (including moss, plankton and plants and their parts, such as fruit, grass, and bark) are food for many animals. They are at the base of most food chains and food webs, and without producers, consumers could not survive. There are many consumers in the Alaskan animal food web, and each consumer has a different role. Some trim grasses, some are food for other animals, some spread seeds and some control prey populations. Decomposers, such as flies and fungi, return nutrients back into the ecosystem. All living things depend upon each other and every living thing has an important role to play.*
- **Describe how a food web differs from a food chain. What can you learn from a food web?** *A food chain shows how energy is transferred between one organism to another Many food chains comprise a food web. From looking at a food web, you can learn how living things are connected and how energy flows through an ecosystem. You can learn which organisms are producers, consumers and decomposers. You can also learn if an organism is an herbivore, omnivore or carnivore from the food web.*
- **What changes can occur when organisms disappear from an ecosystem?** *Because every animal in a food web is intricately connected, the disappearance of even one organism can impact other organisms in an ecosystem. For example, removing grass would mean that deer, caribou, snowshoe hares, porcupines and brown bears would not have food to eat. This could mean gray wolves and red foxes would also have no food to eat. Many animals would not survive, and both the food web and ecosystem would look very different.*

EXTENDING THE LESSON

- **MATH, SCIENCE:** Have students further examine the brown bear's omnivorous diet. How many consumers and producers does the brown bear eat in the food web? Ask students to predict if brown bears eat more plants or animals. Using the background information, explain that the daily diet of a brown bear is made up of roughly 75 percent plants and plant materials (leaves, flowers, nuts) and 25 percent meat. Draw a pie graph of an adult brown bear's diet. How does this compare to students' initial thoughts? Research a kids' daily diet by visiting the

6 How does energy flow through an Alaskan animal food web?

USDA MyPlate website (http://www.choosemyplate.gov/children-over-five.html). Draw a pie graph or color in the MyPlate Sheet (http://www.choosemyplate.gov/print-materials-ordering/ColoringSheet.pdf). How does a student's daily diet compare to that of a brown bear?

RESOURCES

For Students

- EcoKids. *Chain Reaction: Build the Food Chain!* Earth Day Canada. http://www.ecokids.ca/pub/eco_info/topics/frogs/chain_reaction/play_chainreaction.cfm
- Kid's Corner. *The Food Chain Game*. Sheppard Software. http://www.sheppardsoftware.com/content/animals/kidscorner/games/foodchaingame.htm

For Teachers

- Idaho Department of Fish and Game/Idaho ProjectWILD. *Year Rings*. http://idahoptv.org/dialogue4kids/season7/bears/yearrings.cfm
- National Park Service. *Bears of Brooks River: A Photographic Guide to the lives of Katmai's Brown Bears*. http://go.nps.gov/katmai_ebooks
- National Park Service. *Brown Bear – Ursus Arctos*. http://www.nps.gov/kefj/naturescience/brown-bear.htm

CONNECT WITH NATURE

TAKE STUDENTS OUTDOORS to observe food webs near your school or home! Together, look for examples of producers, consumers and decomposers, as well as herbivores, omnivores and carnivores. Have students draw or take photos of these organisms and use their images to construct a food web. Compare this food web to the Alaskan animal food web created in this lesson.

6 How does energy flow through an Alaskan animal food web?

ACTIVITY SHEET 1
GRADES 5-6

SUN

DIRECTIONS: Use the food chain you created as a class to complete the food web below. Draw arrows pointing from the organism that is giving energy to the organism that is gaining energy.

Food chain level

Fruit | **Moss** | **Grass** | **Bark** | **Plankton**

Food chain level

Beaver | **Orb Spider** | **Snowshoe Hare** | **Porcupine**

Caribou | **Salmon** | **White-tailed deer**

Red Fox | **Brown Bear** | **Grey Wolf** | **Bald Eagle**

ROTTING PLANT MATERIAL

Food chain level

Fungi | **Fly**

CARRION

CONNECT WITH NATURE | Spend time in nature! Research and create a food web for an animal in your backyard.

6 How does energy flow through an Alaskan animal food web?

ACTIVITY SHEET 1
GRADES 5-6
ANSWER KEY

DIRECTIONS: Use the food chain you created as a class to complete the food web below. Draw arrows pointing from the organism that is giving energy to the organism that is gaining energy.

SUN

PRODUCER
Food chain level

- Fruit
- Moss
- Grass
- Bark
- Plankton

CONSUMER
Food chain level

- Beaver — Herbivore
- Orb Spider — Carnivore
- Snowshoe Hare — Herbivore
- Porcupine — Herbivore
- Caribou — Herbivore
- Salmon — Omnivore
- White-tailed deer — Herbivore
- Red Fox — Omnivore
- Brown Bear — Omnivore
- Grey Wolf — Carnivore
- Bald Eagle — Carnivore

ROTTING PLANT MATERIAL

DECOMPOSER
Food chain level

CARRION

- Fungi
- Fly

CONNECT WITH NATURE | Spend time in nature! Research and create a food web for an animal in your backyard.

7 How do brown bear cubs learn and grow?

GRADE LEVEL
2-3

SUBJECT AREAS
Geography
Language Art
Science
Social Studies

BACKGROUND INFORMATION
Pages 15-16

VOCABULARY: Den, learned behavior, navigate, nursing, predator

STUDENTS WILL BE ABLE TO...
- Analyze at least two learned behaviors that help brown bear cubs survive in their environment
- Compare how humans grow and change in their first five years to how brown bear cubs grow and change over their first year
- Demonstrate how a brown bear uses its sense of smell as an important adaptation for finding other bears

WHAT YOU NEED
- Activity Sheet 1: How do Brown Bear Cubs Learn and Grow?
- Activity Cards: Scent Cards – How do Brown Bear Cubs Learn and Grow?
- Scents: cinnamon, pine, vanilla, orange, peppermint (or other readily available, easy to recognize scents)
- 30 clean, empty jars, travel size soap bottles or other unmarked containers with holes punched into the lids

LEARNING ACTIVITIES

1. Watch the film clips from the Disneynature **BEARS** website (disney.com/bears) to discover how the cubs learn and grow in their first year. Ask students what behaviors they observed in the film clips. Make as list of their observations.
2. As a class, develop a list of questions that students might ask their caregiver about how they grew and changed over their first year of life. Students should ask about their growth (height and weight), physical development (lift head, roll over, sit upright, crawl, walk…), social emotional development (smile, laugh, play) and educational development (make sounds, simple words, color names, letters, shapes…). Some possible questions: How did I change in my first year? What did I learn to do? What did you first teach me to do? At home, students will do their interviews and create a timeline of events from their lives; they can use photographs, words, drawings. In class students can share this information and you can create a graph of their height and weights or a class timeline of their milestones.
3. Introduce and discuss the term **learned behavior.** *Examples are tying your shoes, riding a bike, reading…* Explain that just like people, brown bears have to learn many behaviors.
4. Distribute the images from Activity Sheet 1 and have students arrange each of the timeline images in order. As a class, identify what each picture shows and discuss the events in a cub's first year. Where are the cubs born? *Cubs are born in their mother's **den**.* What types of food do the cubs try? *Cubs taste a variety of meat and plants in addition to **nursing**.* What does the mother help her cubs hide from? *The mother helps her cubs hide from **predators**.*
5. Compare and contrast Amber and Scout's timeline to the students' first year timelines. Which behaviors are alike and which are different? Discuss the different ways brown bear cubs learn these behaviors using the provided background information.
6. As a class, list the five senses and ask what senses students use most often. Explain that brown bears rely on their sense of smell to identify and remember surroundings. Brown bears also use their sense of smell to find food, communicate, find a mate, detect danger and protect their cubs.

7 How do brown bear cubs learn and grow?

6. Explain that although bears are born with a strong sense of smell, they must learn the smell of their mother. Knowing this distinct scent helps cubs find their mother should they become separated. Demonstrate the importance of a cub learning it's mother's scent using the following activity:
   a. Fill unlabeled jars with cinnamon, pine, vanilla, orange and peppermint scents (six jars of each scent total). Use the real items (line jars with black paper if you are using actual items) or scented oils on cotton balls and place them into each jar so that students can smell but not see the items inside the jars.
   b. Designate scent stations around the classroom (for a class of 30, we suggest five stations). Place one set of scents at each station. Cut out the Scent Cards on Activity Sheet 2. Place a corresponding scent card face down in front of each jar around the room.
   c. Divide the class into five groups and assign each group a scent to locate. Each group represents a set of cubs (Amber and Scout) that must use their sense of smell to navigate through their habitat (the scent stations) to locate their mother (Sky). Provide each group with a sample of their scent to use as a comparison as they go from station to station. The scent represents each group's mother bear.
   d. Beginning at station one, have groups smell inside each jar to identify their assigned scent. Once they have found their scent, groups should turn over the corresponding activity card. If students are correct, the card will show a picture of their scent, confirming they are on the right trail to find their mother. Groups should then proceed to the next station indicated on the card and repeat the activity to mimic a bear searching for its mother. When each group has reached their fifth and final station, they will have successfully found their mother, Sky.

WRAP UP & CHECK FOR UNDERSTANDING

Use the following questions to wrap up the lesson and check for understanding:

- **Describe how brown bear cubs grow and change over their first year.** *Students' answers should demonstrate that brown bear cubs learn many new behaviors in their first year including how to escape predators, find food and locate shelter. Over time, brown bear cubs will try new experiences and become more independent.*
- **Define the term learned behavior and list at least two learned behaviors that help brown bear cubs to survive. What role does the mother play in teaching young cubs these behaviors?** *A learned behavior is a behavior that is taught and developed over time. Students may come up with a variety of behaviors including finding food, seeking shelter and avoiding predators. Students should conclude that cubs depend on their mothers to teach them where to get food, what kinds of food to eat, where to find or make shelter and how to avoid predators. A mother will also demonstrate catching salmon.*

- **How does a bear use its sense of smell?** *Instead of using their eyesight, bears rely on their sense of smell to help them identify and remember many of their surroundings, find food, communicate, find a mate, detect danger and protect their cubs.*

EXTENDING THE LESSON

- **ART & SOCIAL STUDIES:** Have students write a short story about the people in their family that have helped them learn and grow. Have students think about the role each member plays in their family structure. Explain that totems (carved symbolic objects) are one method of storytelling. Totems have historically served the purposes of telling stories, honoring family members and communicating information between the first peoples of Alaska. The people and animals carved into totems are symbolic. As a class, explore how symbols are used in artwork (one resource is: http://www.schoolsliaison.org.uk/aliens/access/signsSym/signsSym.htm). Now have students draw symbols they believe best represent each of their family members. Then have students cut out and arrange the symbols to visually reflect the story they wrote. For example, if one family member is considered very important, that member's symbol might be placed at the top of the totem pole. If another family member is considered to be very supportive, that member's symbol might be placed at the bottom of the totem pole. For additional information

How do brown bear cubs learn and grow?

on the meanings and symbols of totem poles, look over the handout on Northwest Native American Totem Poles (http://www.d123.org/olhms/hmccarthy/documents/NW_Indian_Totem_Poles.pdf). Students should use the arrangement of their symbolic drawings as a guide for creating a three dimensional totem pole.

- *Subtractive Method:* Provide students with a three inch (width) x three inch (depth) x six inch (length) clay rectangle. Demonstrate how to carve away or subtract clay. Then, have students carve their symbols into the clay using their paper arrangement as a guide for their sculpture. For an example of a totem carved with the subtractive approach, visit http://www.hiddenridgegallery.com/store/mitchell-grafton/totem-pole.html.
- *Additive Method:* Provide students with approximately two pounds of clay. Have students roll out a slab of clay and join it at the ends to form a hollow tube. Students should then add more clay to the form to create their symbols using their paper arrangement as a guide for their 3D clay sculpture. Remind students that this sculpture will be viewed in-the-round. This means the back of the sculpture will need to be designed as well.

- **GEOGRAPHY:** Brown bears have a natural ability to navigate. Using a local map, have students find their home (or another landmark of your choosing) in relation to the school. Help each student determine what direction they would need to travel to go home from school. Distribute rulers and have students also determine how far (in kilometers or miles) their destination is.
- **LANGUAGE ARTS:** Divide the class into small groups and have each group research another animal in Katmai. Students should answer the following questions about their animal: what sights, smells, tastes, touches and sounds does the animal encounter? How does it learn to find food, water and shelter? Is the animal alone or in a large group? Have students write and illustrate a picture book to share their findings with the class.
- **MATH:** Have students find information on the weight and size (length) of a bear cub for each of the first 12 months of life and plot these data on two separate graphs (months vs. weight and months vs. length). Compare these graphs to a human infant's first 12 months.
- **MUSIC:** As a class, create a song titled *The Ballad of Amber and Scout*. A ballad is a song form that follows an AABA line scheme (there are 4 lines in each verse and the "A" lines rhyme with each other). Have students compose lyrics for one verse of this song that describes some of the things that happened to Amber and Scout during their first year. To make things simple, have children write lyrics using the tune "Yankee Doodle". When the children have completed their lyrics, take turns singing the verse written by each student. Then, compile these verses into a finished song and sing *The Ballad of Amber and Scout* as a class. You may even choose to perform this song for other classes or at a school assembly.

RESOURCES

For Students

- Eszterhas, Suzi. *Eye on the Wild: Brown Bear*. Frances Lincoln Children's Books: London. 2012.
- Hoshino, Michio. *The Grizzly Bear Family Book*. New York, NY: North-South Books, 1992.
- Jeffe, Elizabeth Dana. *Bears Have Cubs*. Minneapolis, MN: Compass Point Books, 2002.
- Moody-Luther, Jacqueline. *Grizzly Bear Cub*. Norwalk, CT: Soundprints, 2009.
- Zollman, Pam. *A Bear Cub Grows Up*. New York, NY: Scholastic Library Publishing, 2005.

For Teachers

- Grizzly Bay. *The Grizzly Bear Nose*. http://www.grizzlybay.org/LearnMore/GrizzlyBearNose/GrizzlyBearNose.htm
- Grizzly Bay. *Grizzly Cubs*. http://www.grizzlybay.org/LearnMore/CUBS/GrizzlyCubsIndex.htm
- Idaho Department of Fish and Game/Idaho ProjectWILD. *Bearly Born*. http://idahoptv.org/dialogue4kids/season7/bears/bearlyborn2.cfm
- National Park Service. *Bears of Brooks River: A Photographic Guide to the lives of Katmai's Brown Bears*. http://go.nps.gov/katmai_ebooks

DEVELOP STUDENTS' NATURE OBSERVATION SKILLS! Have them pick an animal in their backyard or neighborhood to study. Students should keep a journal about how the animal grows and record information about where it lives, what it eats and any other behaviors they observe. Then, have students get a book about the animal from the library to learn more about its specialized behaviors and adaptations.

Timeline Images

DIRECTIONS: Cut out the photos from Disneynature **BEARS** below and place them in order of events. The photos will follow brown bear cubs Amber and Scout through their first year with their mother, Sky.

Cubs observing salmon fishing

Cubs nursing

Cubs emerging from den

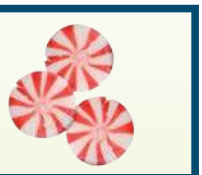
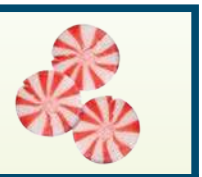
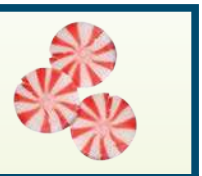
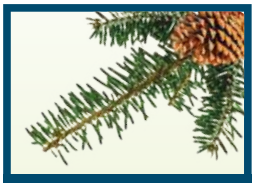
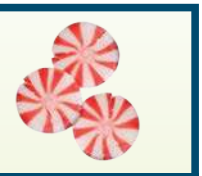
Cubs playing

Cubs resting

Cubs digging for food

Scent Activity Cards

Assign each group a scent to follow. The scent number given corresponds to the station the group should begin at. These activity cards will guide the students to the final station.

ORANGE	CINNAMON	VANILLA	PEPPERMINT	PINE
 Mom has been here! Move to station 2	 Mom has been here! Move to station 3	 Mom has been here! Move to station 4	 Mom has been here! Move to station 5	 Mom has been here! Move to station 1
 Mom has been here! Move to station 3	 Mom has been here! Move to station 4	 Mom has been here! Move to station 5	 Mom has been here! Move to station 1	 Mom has been here! Move to station 2
 Mom has been here! Move to station 4	 Mom has been here! Move to station 5	 Mom has been here! Move to station 1	 Mom has been here! Move to station 2	 Mom has been here! Move to station 3
 Mom has been here! Move to station 5	 Mom has been here! Move to station 1	 Mom has been here! Move to station 2	 Mom has been here! Move to station 3	 Mom has been here! Move to station 4
 You found your mom, Sky!	 You found your mom, Sky!	 You found your mom, Sky!	 You found your mom, Sky!	 You found your mom, Sky!

8 How do scientists use footprints to study bears?

GRADE LEVEL
2-3

SUBJECT AREAS
Art
Language Arts
Science
Social Studies

BACKGROUND INFORMATION
Pages 16-17

VOCABULARY: Camouflage, ecosystem, footprint, scientist, species

STUDENTS WILL BE ABLE TO...
- Recognize similarities and differences among four brown bears
- Describe how footprints can help scientists study brown bears
- Determine which brown bears visited the river using footprints
- Predict what challenges scientists might face when studying brown bears
- Summarize the importance of studying brown bears as it relates to wildlife conservation

WHAT YOU NEED
- Activity Sheet 1: Brown Bear Identification Guide
- Activity Sheet 2: Which brown bears have visited this river?
- Pen or pencil for each student

LEARNING ACTIVITIES

1. Discuss how we know so much about brown bears. What skills do scientists need to effectively study animals? Students should conclude that **scientists** who study bears help people better understand the world of these amazing animals. Explain that scientists need excellent observation skills to study wildlife. Share the Bears of Brooks River: A Photographic Guide to the lives of Katmai's Brown Bears (http://go.nps.gov/katmai_ebooks) with students to show them the diversity of bears in Katmai National Park. Does every bear look the same? Which bears look most alike? Which bears look different? Do bears that are related (such as moms and cubs) share any similar traits? *Students should conclude that even within the same species, individuals vary in appearance. Brown bears come in many shapes, colors and sizes, and while some may look similar, they all have differences.* For this reason, fur color, body size and shape, and distinct markings such as scars can help scientists identify and study specific bears.

2. Show students photographs of brown bear footprints from the gallery featured on disney.com/bears. Explain that even a bear's **footprints** are unique; making them a useful trait for studying brown bears. From footprints, scientists can identify individual bears that have visited an area, which direction the bears are heading, the approximate size of the bears and if the bears are traveling alone or with cubs. Scientists in Katmai National Park use footprints and observations to study bears during the summer months when they gather along the river to fish for salmon. Share photographs from the image gallery and the Live Bear Cam from Brooks Falls in Katmai National Park (www.explore.org/bears) to show students what this amazing gathering of bears looks like.

3. Distribute Activity Sheets 1-2 to the class. Have students become brown bear scientists. Their objective is to identify which bears have visited the river using bear footprints. Students may work individually or in groups using Activity Sheet 1 to complete Activity Sheet 2.
As a class, discuss students' results using Activity Sheet 2 and the questions provided below.

8 How do scientists use footprints to study bears?

WRAP UP & CHECK FOR UNDERSTANDING

Wrap up the lesson and check for understanding using the following questions:

- **How can scientists use differences in a brown bear's appearance to learn more about an animal?** *Although animals may look similar, and young animals may resemble their parents, each individual has slight differences that can be observed and recorded. Brown bears can be distinguished by a variety of characteristics: lighter or darker fur, shorter or longer noses, size of shoulder humps, long or short claws, and scars or injuries. Scientists can use these differences to identify and study individual animals in an area to learn more about how brown bears live, use their space and interact with each other.*
- **Describe how footprints help scientists study brown bears.** *Footprints can help scientists identify individual bears that have visited an area, which direction the bears are heading, the approximate size of the bears and if the bears are traveling alone or with cubs.*
- **Summarize how scientists can use the information they collect to protect animals like brown bears.** *Studying animals allows us to better understand their needs, how they use their space and how they interact with each other. Knowing these things helps us to understand what areas of an ecosystem provide important sources of food, water and shelter for brown bears. As a result, people can make better decisions about how our actions impact brown bears. For more on safely visiting brown bear country and living safely with bears, refer to Lessons 10-11.*

EXTENDING THE LESSON

- **ART:** Provide students with a variety of images (suggested books are included at the end of this lesson) of different paw prints from Alaskan animals. Have students compare and contrast paw shape, size and number of paw pads in different Alaskan animals. Then have students choose an array of paw print images to use in the creation of their own paw print clay quilt sculpture. Their objective is to create a visually interesting composition of paw prints using a grid as a guideline. Explain to students that this sculpture will be a bas-relief (low relief) sculpture, meaning the sculpture will only be viewed from the front and will have different depths in the clay's surface that should reflect the weight of the bears. Working in small groups, have students roll out a slab of clay measuring 12 inches by 12 inches. Using a carving tool, have students mark off three inch by three inch squares to create a grid both vertically and horizontally on the surface of the clay. As a group, have students decide which paw prints will be placed in the cells of the grid they have created. Students may choose to repeat particular paw prints in order to create a pattern. They may also choose to begin with the largest paw prints and end with the smallest paw prints or vise versa. Students should then trace over the back of their chosen paw print image with a wet-erase marker (this particular marker will transfer to the surface of the clay) by lining up their image with a cell in the grid, laying the paper with the black marker onto the surface of the clay, and then burnishing (rubbing) the traced image onto the surface of the clay. Students can then carve these images into the surface of the clay using the traced image as a guide.
- **ART, SCIENCE, AND SOCIAL STUDIES:** Introduce students to the challenges and rewards of making a nature documentary using the "Making of" film clips from Disneynature EARTH, OCEANS, AFRICAN CATS, CHIMPANZEE or **BEARS** (disneynature.com/video). Discuss what obstacles the Disneynature filmmakers

8 How do scientists use footprints to study bears?

faced when creating a film? How might these obstacles be similar and different to those that scientists face when researching animals? Ask students what animal or topic for a nature documentary they would like to make, and why? Using clean materials, such as cardboard, string, paper towel tubes, paper plates, foil, etc., from a scrap bin, have students create a three dimensional model of a new tool or piece of technology that would help them capture footage of their topic. What is the purpose of the technology tool: to observe range of motion? To track an animal as it moves through its environment? To capture footage from a far distance or extremely close? Students should present their invention to the class and explain how it would help them film something never before caught on camera. Another option is to provide students with video cameras and editing software (iMovie or the SPLICE app) to create their own two-minute nature documentary on a subject of their choice.

RESOURCES

For Students

- Dendy, Leslie. *Tracks, Scats and Signs*. NorthWood Publishing: Minnetonka, MN. 1995
- Halfpenny, Ph.D, James C. *Scat and Tracks of Alaska, Including the Yukon and British Colombia*. Falcon Publishing: Kingwood, TX. 2007.
- Sheldon, Ian and Tamara Hartson. *Animal Tracks of Alaska*. Lone Pine Publishing: Edmonton, AB, Canada. 1999

For Teachers

- National Park Service. *Bears of Brooks River: A Photographic Guide to the lives of Katmai's Brown Bears*. http://go.nps.gov/katmai_ebooks
- North American Bear Center. *Become a Bear Scientist*. http://www.bear.org/website/images/stories/education-outreach/lesson-plans/Become_Bear_Scientist.pdf
- North American Bear Center. *Making Bear Tracks*. http://www.bear.org/website/images/stories/education-outreach/lesson-plans/Making_Bear_Tracks.pdf

CONNECT WITH NATURE

Have students **LOOK FOR ANIMAL FOOTPRINTS** in their backyard or schoolyard! Use a field guide and digital camera to identify and record tracks in their area. They can document their findings using a slideshow, photo book or video montage and add captions or narration to include new facts they learned. Encourage students to share their documentary with friends and family to inspire them to care for wildlife and wild places.

Brown Bear Identification Guide

Help scientists learn which bears have visited the river! Use the pictures, rear footprints and discriptions in the Brown Bear Identification Guide below to complete Activity Sheets 2 and 3.

Sky
Adult Female

NOTES: Large adult female with dark coat and long claws. Sky visits the river to catch fish to eat. She needs to feed her growing cubs.

Chinook
Adult Male

NOTES: Adult male with wide paws and short claws. Chinook often competes with other bears for fishing spots on the river.

Amber
Young cub

NOTES: Amber's paw is thin and long. She watches her mother's every move – learning the best ways to open clams or fend off wolves. If Sky happens to catch a fish, Amber will be there to share it with her.

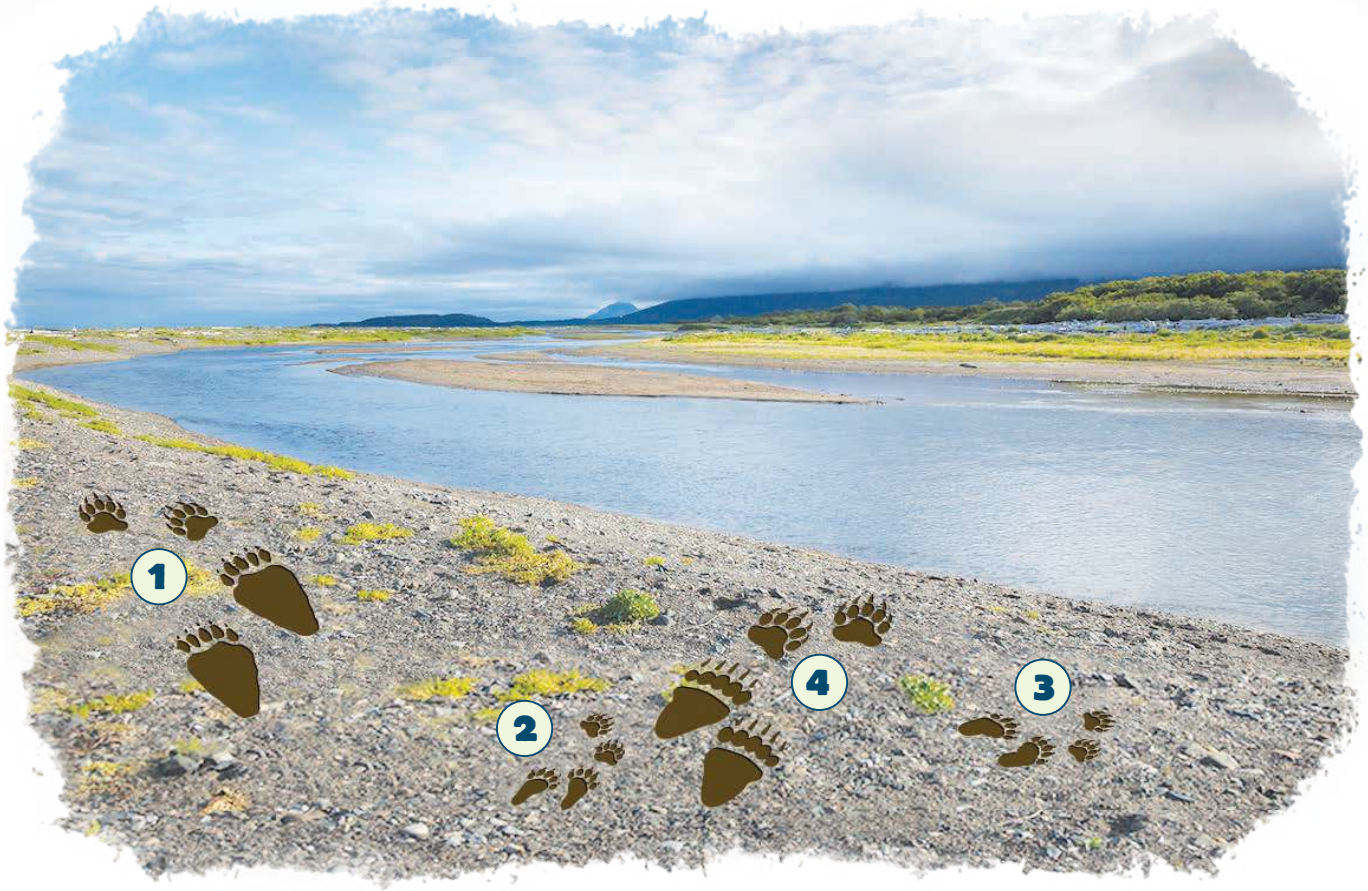
Scout
Young cub

NOTES: Scout's paw is wide and short. Scout is a fearless adventurer who puts his nose everywhere – especially where it doesn't belong. Scout can get into trouble, but Sky is always there to protect Scout.

CONNECT WITH NATURE | Use a local field guide to explore your backyard or a park near your home! Have an adult help you make plaster molds of any footprints you find.

Which Brown Bears Visited This River?

The river is a popular spot for brown bears in Katmai National Park! Use the back footprints from the brown bear Identification Guide to decide which prints belong to each bear.



Based on my observations, these brown bear footprints belong to:

1. _____ 2. _____

3. _____ 4. _____

Why do you think bears are visiting this river?

_____

Do you think this area of the river should be protected? Why or why not?

_____

_____

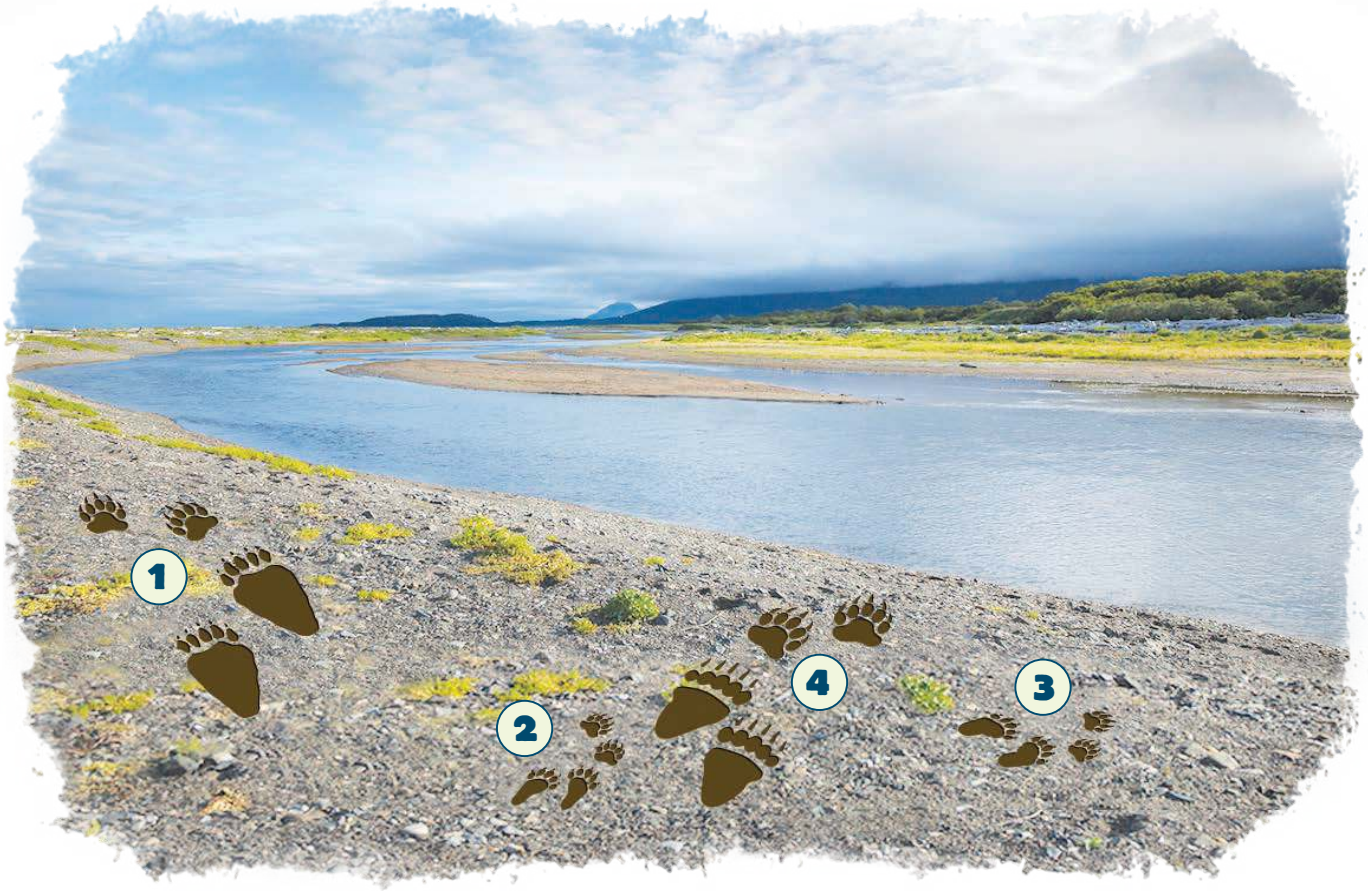
CONNECT WITH NATURE

Use a field guide to look for and identify animal footprints in your backyard or near your school!

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Which Brown Bears Visited This River?

The river is a popular spot for brown bears in Katmai National Park! Use the back footprints from the brown bear Identification Guide to decide which prints belong to each bear.



Based on my observations, these brown bear footprints belong to:

1. *Chinook*
2. *Amber*
3. *Scout*
4. *Sky*

Why do you think bears are visiting this river?

Do you think this area of the river should be protected? Why or why not?

CONNECT WITH NATURE

Use a field guide to look for and identify animal footprints in your backyard or near your school!

9 What methods do scientists use to study brown bear populations worldwide?

GRADE LEVEL
4-6
•
SUBJECT AREAS
Art
Math
Language Arts
Science
Social Studies
•
BACKGROUND INFORMATION
Pages 16-17

VOCABULARY: Amino acid, camera trap, cell, chromosome, coordinate, data, deoxyribonucleic acid (DNA), global positioning satellite (GPS), hair snare, home range, latitude, longitude, nucleus, population, scat

STUDENTS WILL BE ABLE TO...
- Interpret simple DNA sequences to identify and count individual brown bears in a population
- Graph and analyze GPS data to determine how brown bears move through and use their habitat
- Examine non-invasive sampling methods used by scientists to study brown bears
- Determine the importance of using multiple methods when studying brown bears
- Predict how scientists might use the information they collect to protect animals like brown bears

WHAT YOU NEED
- Activity Sheet 1: Using DNA and GPS to Study Brown Bears
- Activity Sheet 2: Mapping GPS Data: How do Brown Bears use their Habitat?
- Activity Sheet 3: Studying Brown Bears Worldwide

LEARNING ACTIVITIES

1. Discuss the importance of studying brown bears. What skills do scientists need to study brown bears worldwide? What types of science (biology, ecology, earth science, chemistry, geography, etc.) might be involved in studying brown bears? What challenges might scientists face when studying brown bears that are very large, often solitary, move through thick forests and travel long distances? What technology might help scientists study brown bears safely from a distance? How might studying brown bears and their habitat help people to better protect them?
2. Using the background information and additional resources at the end of this lesson, introduce students to methods that scientists use to study brown bears around the world such as as **camera traps**, tree scratches and even helicopters. Clarify that these methods are not used to study brown bears in Katmai National park, but they are important tools and techniques for studying bears and other wildlife globally.
3. Scientists are also using advanced technology to learn more about brown bears. Collecting **deoxyribonucleic acid (DNA)** from hair snares and scat (animal poop) samples and plotting brown bear movement using **global positioning satellite (GPS)** technology has allowed us to study bears in a variety of habitats around the world:

- DNA Technology: use an image or interactive model of an animal cell (such as http://cellsalive.com/cells/cell_model.htm) to explain that all living organisms are made up of **cells**. The center of a cell is called a **nucleus**. Inside the nucleus are **chromosomes** that contain a molecule called deoxyribonucleic acid (DNA). Use books or the Internet to show students a picture of DNA; explain that DNA is made of special molecules called **amino acids** (one resource is: http://science.nayland.school.nz/graemeb/images/2011/ChromosomeDNA.gif). Amino acids can be coded using the letters A, C, G and T and a string of these letters put together is called a DNA **sequence**. DNA sampling can be

9 What methods do scientists use to study brown bear populations worldwide?

used to tell how many different animals are in an area. On a more complex level, scientists can also use DNA to distinguish males and females in a **population** and determine which animals are related. In a laboratory, DNA can be extracted from hair, fingernails, blood and **scat**. In fact, scientists may use tracking dogs to find brown bear scat in the forest. DNA from hair and scat allows scientists to collect **data** without having to capture or get close to bears.

- GPS Technology: GPS technology uses a series of **satellites** to collect and record a specific location on Earth. Scientists can use a handheld GPS device to mark where they find animal clues or the boundaries of an important habitat area. Scientists can also use special bear collars (similar to one you might use for your dog or cat, but on a much larger scale!) equipped with a GPS recording device. As the animal moves, the GPS collar records the animal's location using **latitude** and **longitude** points, which are recorded in degrees, minutes and seconds. Since there are 60 minutes (') per degree and 60 seconds (") per minute, a coordinate would be written as 59° 32' 30". This precise level of detail allows scientists to accurately record location to within an inch! Paired sets of latitude and longitude points are called coordinates. Once these coordinates are recorded, the data is transmitted via satellite to a computer system. By collecting and plotting GPS coordinates, scientists can create a map of an animal's **home range** and track an animal's movements through its environment.

4. Distribute a copy of Activity Sheets 1-3 to each student. As brown bear field researchers, have students complete the DNA portion of Activity Sheet 1 first to identify how many bears have been found in the area. Next, they should plot the GPS coordinates from Activity Sheet 1 onto Activity Sheet 2 to learn the movements of five specific brown bears. Finally, have students use the field notes on Activity Sheet 3 to answer questions and make observations about other methods that scientists use to study brown bears.

5. Use the following questions to drive discussion while completing Activity Sheets 1-3.

a. In what season did scientists collect GPS data and why? What method might scientists use instead of GPS to study bears during the winter? *The GPS data was collected during the spring and summer when brown bears are searching for food. From November until April, brown bears are resting in their dens and are not moving through their habitat. During this time, GPS collars are not an effective method for studying brown bears. A different method such as a camera mounted inside the den might show den activity for females such as the birth of young and young nursing.*

b. Using Activity Sheet 2, compare the home range of male and female brown bears. Which home range is bigger? Predict why this might be the case. *In general, male brown bears have much larger home ranges than female brown bears. This may be true for several reasons. Males are much larger than females, so they require more food and may have to travel farther distances to find this food. In the summer, males are also looking for a mate and may travel throughout their range in search of other bears. Often, females are with cubs and want to stay close to their den to keep cubs protected and safe from predators. Caring for young bears also means that females cannot travel as far as adult males.*

c. What is happening near the river during the summer that makes this a popular spot for brown bears? *During the summer, there is an abundance of salmon as they swim upstream to lay eggs. Salmon are an important source of protein and fat for brown bears, so many bears will gather around the river to fish.*

d. Analyze the path of Bear 4. How is her home range different from the range of all other bears? What challenges might exist between Bear 4 and people visiting or living near the park? *Bear 4 has a home range that extends beyond the park boundaries. This poses challenges because throughout the summer, Bear 4 has traveled very close to the town of Akire and into the campsites of people staying in the park. She may have been*

9 What methods do scientists use to study brown bear populations worldwide?

drawn to the campsites or town based on human actions (such as leaving out food) or because there was not enough space for her in the park. However, because she has been coming so close to people, a human-wildlife conflict might occur. (For more on human-wildlife conflict and ways people can live safely with bears, see Lesson 11.)

WRAP UP & CHECK FOR UNDERSTANDING

Wrap up the lesson and check for understanding using the following questions and activities:

- **Describe in your own words how scientists collect DNA and explain why DNA can be a useful tool for studying large predators such as brown bears.** *Because DNA samples can be extracted from an animal's hair or scat, it is a safe method for learning more about large predators such as brown bears from a distance. DNA sampling can be used to tell how many different animals are in an area, to distinguish males and females in a population and to determine which animals are related.*
- **Describe what scientists can learn about an animal and its habitat using GPS technology.** *By collecting and plotting GPS coordinates, scientists can track an animal's movements through its environment and learn how an animal is using its habitat.*
- **Predict how people might use the information that scientists collect to protect and live safely with animals like brown bears.** *Studying these animals allows scientists to better understand how brown bears use their space, interact with each other and what areas provide important sources of food, water and shelter for brown bears. Based on this information, people can protect areas of land that brown bears depend upon to survive. Also, because people and brown bears often share the same space, this information can help people make better decisions about where to build homes, stores or roads that are farther away from brown bear habitat. As a result, the needs of both bears and people are met – the ultimate goal of wildlife conservation. (For more information on living safely with brown bears, refer to Lesson 11 in this Educator's Guide.)*

EXTENDING THE LESSON

- **ART, SCIENCE:** Have students work in small groups to design their own tracking device for an animal! Put together 10 bags that contain one plush animal (suggestions include familiar animals such as a frog, lizard, bird, sea turtle, deer, bat, raccoon, rhinoceros, elephant, tiger) and the following materials: string or yarn, small wooden blocks, small plastic balls, Velcro and rubber bands of various sizes. Distribute one bag to each small group and have students consider the following: How big is the animal? How does the animal move? What kind of environment does it live in? What are some of its natural behaviors? Explain that the device must be the correct size, shape and weight (as light as possible) when compared to the animal's body. Adaptations and environment must also be considered (birds must be able to fly so their device cannot restrict wing movement; sea turtles live underwater so their device must allow them to swim and also be waterproof). Give students time to build their tracking device and attach it to their plush animal. Have each group present their device to the class and explain their design. Discuss the similarities and differences in tracking devices as a class.

- **ART, LANGUAGE ARTS, SOCIAL STUDIES:** Before maps, compasses or computers, scientists and explorers used the sun, moon and stars to navigate. People gave constellations (patterns of stars) the Greek or Latin names of mythological beings and wrote legends around their origin. In the Northern Hemisphere, the North Star, part of Ursa Minor, was particularly helpful in navigation. As a class, use books, the internet or apps such as SkyView to find pictures of Ursa Minor and Ursa Major. Students should identify the shape of these constellations as bears! Visit http://pages.csam.montclair.edu/~west/UMamyths.html and http://www.comfychair.org/~cmbell/myth/ursa_minor.html to read the myths of Ursa Major and Ursa Minor. Then, have students create their own bear constellation by drawing a bear with white chalk on black construction paper (use plush bears or bear images from disney.com/bears to provide students with a visual

9 What methods do scientists use to study brown bear populations worldwide?

reference). Use the point of a pencil or a push pin to make several small holes in the outline of their bear. Have students name and write a short myth (one paragraph or less) that explains how their constellation got into the sky. Finally, turn out the lights and let each student take turns placing their constellation against a single, bright light source (desk lamp, window, etc.). Ask students to announce the name of their constellation and narrate their myth. Students may also discuss where their constellation would be positioned in the night sky relative to other constellations.

- **LANGUAGE ARTS, SCIENCE, SOCIAL STUDIES:** Have students work in small groups to design their own bear study. What questions do scientists still have about brown bears? What do they want to know? What methods might students use to find out these answers? Where (location), when (time of year and time of day) and for how long (one month, one year, several years?) will their study take place? What equipment will they need for themselves and for the study (think about clothing, food supplies, safety and communication tools, research tools and technology)? Have each group write their own "research proposal" (two paragraphs or less) that includes the topic, location, time frame, materials needed and methods (one great resource is *Just the Facts: Writing Your Own Research Report* by Nancy Loewen). Have small groups compare ideas. What topics or questions are other groups researching? How have others prepared for their study? How might methods change depending on the questions we ask (for example, would you use the same methods to find out how many brown bears live in an area and how a brown bear catches fish)? What can you learn from other students' work that might help you improve or support your research efforts?
- **SCIENCE:** As a class, create a hair snare to illustrate how hair samples are taken from brown bears. Some students can act as brown bear neighbors (for ideas refer to Lesson 2) and some can act as brown bears. Students should attach cotton balls to their clothes using double sided tape to simulate hair. Put strips of Velcro on pieces of string and place these around the classroom (on walls, across the floor, strung between desks, etc.) to simulate the barbed wire used to collect hair snares. Have kids try moving like their animal (crawling, hopping, etc. and at appropriate heights) while passing through or over the Velcro. As students pass by the Velcro, the cotton balls should get stuck; simulating the way hair is collected on barbed wire. Discuss the outcome of this activity. Which students were "sampled" and which were not – why? How could height levels be adjusted to sample just for bears? How could the sampling methods be improved? Have students take turns being different animals and trying out various heights of Velcro around the classroom.

9 What methods do scientists use to study brown bear populations worldwide?

RESOURCES

For Students and Teachers

- Bell, Cathy. *Ursa Minor: The Lesser Bear.* http://www.comfychair.org/~cmbell/myth/ursa_minor.html.
- Cascades Carnivore Connectivity Project. http://www.cascadesconnectivity.org/research/methods/
- Celizic, Mike. *Today Show: Hidden Cameras Reveal the Secret Lives of Bears.* NBC News. http://www.today.com/id/25452868
- CELLS Alive! *Interactive Animal Cell.* http://cellsalive.com/cells/cell_model.htm
- Laskin, David. *Tracking Grizzly Bears from Space*. TED-Ed Lessons. http://ed.ted.com/lessons/tracking-grizzly-bears-from-space-david-laskin#watch
- Montana Fish and Wildlife. *Montana Grizzly Bear DNA – Parts I and II*. http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/beBearAware/videos.html
- Montclair State University. *Ursa Major Myths*. http://pages.csam.montclair.edu/~west/UMamyths.html
- Northern Rocky Mountain Science Center. *Noninvasive Methods to Estimate Bear Population*. Department of Interior, United States Geological Survey (USGS). 2012. http://www.nrmsc.usgs.gov/files/norock/products/CYEinfosheet_c508.pdf
- Northern Rocky Mountain Science Center. *Still Photographs at Hair Traps.* Department of Interior, United States Geological Survey (USGS). http://www.cascadesconnectivity.org/photo-gallery/black-bears/

For Teachers

- eHow. *Animal Cell Structure*. http://www.ehow.com/article-new/ehow/images/a05/47/ro/cell-structure-animal-800x800.jpg
- Loewen, Nancy. *Just the Facts: Writing Your Own Research Report*. North Mankato, MN: Picture Window Books. 2009.
- Nayland College. *Chromosomes and DNA*. http://science.nayland.school.nz/graemeb/images/2011/ChromosomeDNA.gif
- Nationalatlas.gov. *Mapping Latitude and Longitude*. http://www.nationalatlas.gov/articles/mapping/a_latlong.html#two
- North American Bear Center. *How many black bears will reproduce?* http://www.bear.org/website/images/stories/education-outreach/lesson-plans/How_Many_Black_Bears_Will_Reproduce.pdf
- Northern Divide Grizzly Bear Project. *A study to estimate the grizzly bear population size in the Northern Continental Divide Ecosystem, Montana, U.S.A.* Department of Interior, United States Geological Survey. 2007. http://www.nrmsc.usgs.gov/files/norock/products/NCDE_overview.pdf

YOU CAN HELP | **ORGANIZE A SCHOOL FUNDRAISER** to raise money for brown bear conservation. Donate your class proceeds to an organization such as the National Park Foundation that is working to study and protect brown bears and their habitats.

Using DNA and GPS to Study Brown Bears

Scientists around the world use many different tools and technologies to study brown bears. Now it's your turn to be a global brown bear scientist! Use the DNA sequences and GPS waypoints below to learn about the different bear populations living outside Katmai National Park.

DNA Sequences

Lab testing revealed 15 DNA sequences from brown bear hair and scat. Look at the sequences below to determine how many different bears are in this area. Each bear has a different sequence.

ATA GCA CCT
AAC CCT GGT
GGA TCA CCT
TAC GTA TTC
CTA TAC GTA
TTC CCG ATA
CCA GGT CTA
TTC CGA AAC
ATA GCA CCT
TTC CCG ATA
CCA GGT CTA
ATA GGA CTC
CCT GAT CAT
GGA TCA CCT
ACA GTG CTA

How many different bears are represented by the DNA sequences? _____

Did scientists collect DNA from any of the five bears fitted with GPS collars on the right? Draw a line to match the bear to its DNA.

GPS Waypoints

Graph the GPS waypoints shown here for each bear on Activity Sheet 2 to learn how the bears are moving through the study area.

Bear 1: Adult Female
DNA: TAC GTA TTC
March 29, 2013
Point 1: N 59° 31' 00" W 154° 59' 00"
April 16, 2013 — Bear emerges from den
Point 2: N 58° 30' 00" W 154° 58' 45"
May 30, 2013
Point 3: N 58° 30' 00" W 154° 56' 45"
July 14, 2013
Point 4: N 59° 31' 00" W 154° 56' 00"
August 21, 2013
Point 5: N 59° 31' 30" W 154° 57' 00"
September 27, 2013
Point 6: N 59° 31' 00" W 154° 58' 00"
October 28, 2013 — Bear entered den for winter
Point 7: N 59° 31' 30" W 154° 59' 00"

Bear 2: Adult Female
DNA: TTC CGA AAC
April 30, 2013
Point 1: N 58° 30' 00" W 154° 52' 45"
May 15, 2013 — Bear emerges from den
Point 2: N 58° 30' 30" W 154° 53' 45"
July 25, 2013
Point 3: N 58° 30' 00" W 154° 54' 45"
August 5, 2013
Point 4: N 59° 30' 30" W 154° 55' 45"
September 1, 2013
Point 5: N 59° 32' 00" W 154° 55' 00"
September 3, 2013
Point 6: N 59° 31' 30" W 154° 53' 00"
October 29, 2013
Point 7: N 58° 30' 00" W 154° 52' 45"
Bear entered den for winter

Bear 3: Adult Male
DNA: ATA GCA CCT
April 13, 2013
Point 1: N 59° 35' 30" W 154° 52' 45"
May 22, 2013 — Bear emerges from den
Point 2: N 59° 33' 30" W 154° 53' 00"
July 14, 2013
Point 3: N 59° 33' 00" W 154° 55' 00"
August 5, 2013
Point 4: N 59° 31' 30" W 154° 55' 45"
September 1, 2013
Point 5: N 59° 35' 30" W 154° 56' 00"
October 16, 2013
Point 6: N 59° 36' 30" W 154° 54' 00"
November 1, 2013
Point 7: N 59° 35' 30" W 154° 52' 45"
Bear entered den for winter

Bear 4: Adult Female
DNA: CCA GGT CTA
March 27, 2013
Point 1: N 59° 33' 00" W 154° 58' 45
April 27, 2013 — Bear emerges from den
Point 2: N 59° 35' 30" W 154° 58' 45
May 4, 2013
Point 3: N 59° 36' 30" W 154° 59' 00
June 23, 2013
Point 4: N 59° 35' 30" W 154° 56' 45
June 26, 2013
Point 5: N 59° 34' 30" W 154° 56' 45
August 20, 2013
Point 6: N 59° 34' 00" W 154° 58' 00
October 21, 2013
Point 7: N 59° 33' 00" W 154° 58' 45
Bear entered den for winter

Bear 5: Adult Male
DNA: TTC CCG ATA
May 1, 2013
Point 1: N 59° 38' 00" W 154° 52' 45"
May 30, 2013 — Bear emerges from den
Point 2: N 59° 37' 00" W 154° 53' 00"
June 16, 2013
Point 3: N 59° 37' 30" W 154° 54' 45"
July 25, 2013
Point 4: N 59° 37' 00" W 154° 55' 45"
August 14, 2013
Point 5: N 59° 37' 00" W 154° 54' 45"
August 28, 2013
Point 6: N 59° 37' 00" W 154° 54' 45"
September 9, 2013 — GPS Collar found in the woods

CONNECT WITH NATURE | Organize a school fundraiser to raise money for brown bears. Donate your proceeds to an organization such as the National Park Foundation!

Using DNA and GPS to Study Brown Bears

Scientists around the world use many different tools and technologies to study brown bears. Now it's your turn to be a global brown bear scientist! Use the DNA sequences and GPS waypoints below to learn about the different bear populations living outside Katmai National Park.

DNA Sequences

Lab testing revealed 15 DNA sequences from brown bear hair and scat. Look at the sequences below to determine how many different bears are in this area. Each bear has a different sequence.

ATA GCA CCT
AAC CCT GGT
GGA TCA CCT
TAC GTA TTC
CTA TAC GTA
TTC CCG ATA
CCA GGT CTA
TTC CGA AAC
ATA GCA CCT
TTC CCG ATA
CCA GGT CTA
ATA GGA CTC
CCT GAT CAT
GGA TCA CCT
ACA GTG CTA

How many different bears are represented by the DNA sequences? *10*

Did scientists collect DNA from any of the five bears fitted with GPS collars on the right? Draw a line to match the bear to its DNA.

GPS Waypoints

Graph the GPS waypoints shown here for each bear on Activity Sheet 2 to learn how the bears are moving through the study area.

Bear 1: Adult Female
DNA: TAC GTA TTC
March 29, 2013
Point 1: N 59° 31' 00" W 154° 59' 00"
April 16, 2013 — Bear emerges from den
Point 2: N 58° 30' 00" W 154° 58' 45"
May 30, 2013
Point 3: N 58° 30' 00" W 154° 56' 45"
July 14, 2013
Point 4: N 59° 31' 00" W 154° 56' 00"
August 21, 2013
Point 5: N 59° 31' 30" W 154° 57' 00"
September 27, 2013
Point 6: N 59° 31' 00" W 154° 58' 00"
October 28, 2013 — Bear entered den for winter
Point 7: N 59° 31' 30" W 154° 59' 00"

Bear 2: Adult Female
DNA: TTC CGA AAC
April 30, 2013
Point 1: N 58° 30' 00" W 154° 52' 45"
May 15, 2013 — Bear emerges from den
Point 2: N 58° 30' 30" W 154° 53' 45"
July 25, 2013
Point 3: N 58° 30' 00" W 154° 54' 45"
August 5, 2013
Point 4: N 59° 30' 30" W 154° 55' 45"
September 1, 2013
Point 5: N 59° 32' 00" W 154° 55' 00"
September 3, 2013
Point 6: N 59° 31' 30" W 154° 53' 00"
October 29, 2013
Point 7: N 58° 30' 00" W 154° 52' 45"
Bear entered den for winter

Bear 3: Adult Male
DNA: ATA GCA CCT
April 13, 2013
Point 1: N 59° 35' 30" W 154° 52' 45"
May 22, 2013 — Bear emerges from den
Point 2: N 59° 33' 30" W 154° 53' 00"
July 14, 2013
Point 3: N 59° 33' 00" W 154° 55' 00"
August 5, 2013
Point 4: N 59° 31' 30" W 154° 55' 45"
September 1, 2013
Point 5: N 59° 35' 30" W 154° 56' 00"
October 16, 2013
Point 6: N 59° 36' 30" W 154° 54' 00"
November 1, 2013
Point 7: N 59° 35' 30" W 154° 52' 45"
Bear entered den for winter

Bear 4: Adult Female
DNA: CCA GGT CTA
March 27, 2013
Point 1: N 59° 33' 00" W 154° 58' 45
April 27, 2013 — Bear emerges from den
Point 2: N 59° 35' 30" W 154° 58' 45
May 4, 2013
Point 3: N 59° 36' 30" W 154° 59' 00
June 23, 2013
Point 4: N 59° 35' 30" W 154° 56' 45
June 26, 2013
Point 5: N 59° 34' 30" W 154° 56' 45
August 20, 2013
Point 6: N 59° 34' 00" W 154° 58' 00
October 21, 2013
Point 7: N 59° 33' 00" W 154° 58' 45
Bear entered den for winter

Bear 5: Adult Male
DNA: TTC CCG ATA
May 1, 2013
Point 1: N 59° 38' 00" W 154° 52' 45"
May 30, 2013 — Bear emerges from den
Point 2: N 59° 37' 00" W 154° 53' 00"
June 16, 2013
Point 3: N 59° 37' 30" W 154° 54' 45"
July 25, 2013
Point 4: N 59° 37' 00" W 154° 55' 45"
August 14, 2013
Point 5: N 59° 37' 00" W 154° 54' 45"
August 28, 2013
Point 6: N 59° 37' 00" W 154° 54' 45"
September 9, 2013 — GPS Collar found in the woods

CONNECT WITH NATURE | Organize a school fundraiser to raise money for brown bears. Donate your proceeds to an organization such as the National Park Foundation!

Mapping GPS Coordinates

How do brown bears use their habitat?

STEP 1: Count the number of squares inside the shape made by the bear's path (note: you may need to put two or more partial squares together to make a whole square).

Total number of squares inside each bear's path:

Bear 1: _____

Bear 2: _____

Bear 3: _____

Bear 4: _____

STEP 2: Multiply the number of squares inside the bear's path by the area of one square to calculate the total area (km^2) of the bear's path.

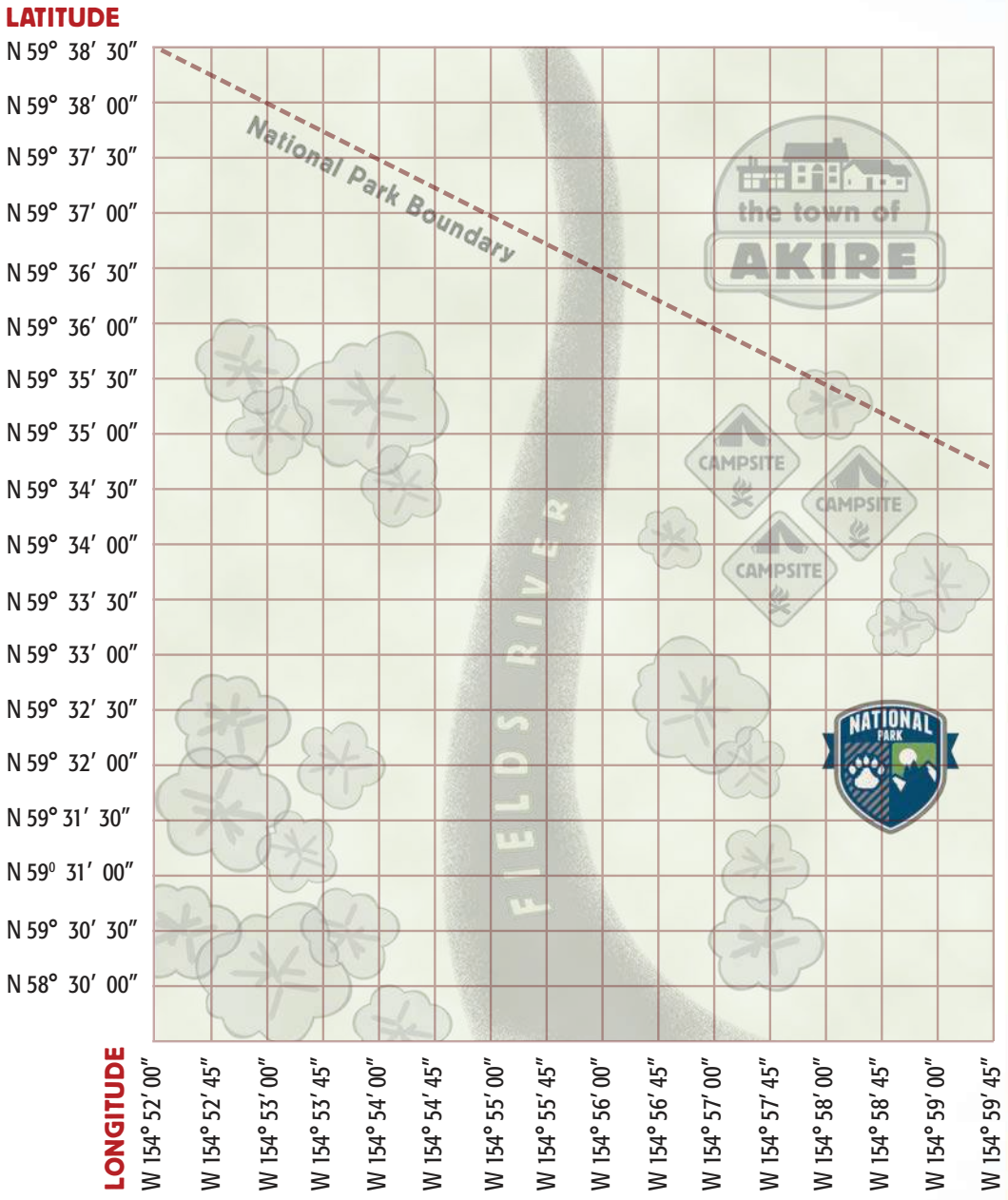
Total area of bear's path:

Bear 1: _____

Bear 2: _____

Bear 3: _____

Bear 4: _____



KEY

■ = Bear 1 ■ = Bear 2 ■ = Bear 3
■ = Bear 4 ■ = Bear 5
Scale: ☐ = .25km²

CONNECT WITH NATURE

Write to your local or state representative asking them to support laws that protect wildlife!

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Mapping GPS Coordinates

How do brown bears use their habitat?

STEP 1: Count the number of squares inside the shape made by the bear's path (note: you may need to put two or more partial squares together to make a whole square).

Total number of squares inside each bear's path:

Bear 1: 12

Bear 2: 15

Bear 3: 35

Bear 4: 15.5

STEP 2: Multiply the number of squares inside the bear's path by the area of one square to calculate the total area (km^2) of the bear's path.

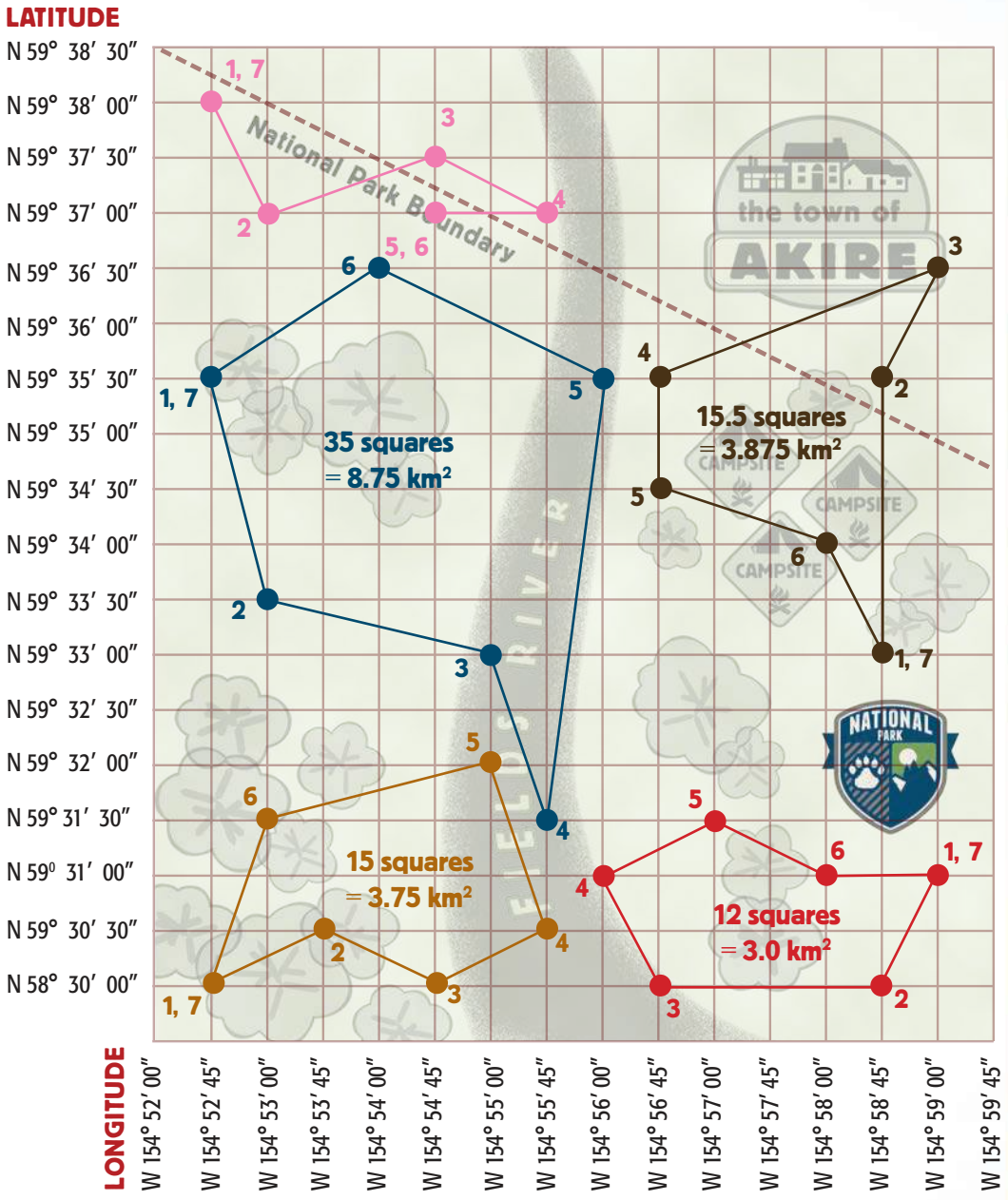
Total area of bear's path:

Bear 1: 3.0 km^2

Bear 2: 3.75 km^2

Bear 3: 8.75 km^2

Bear 4: 3.875 km^2



KEY

■ = Bear 1 ■ = Bear 2 ■ = Bear 3
■ = Bear 4 ■ = Bear 5
Scale: ☐ = .25km²

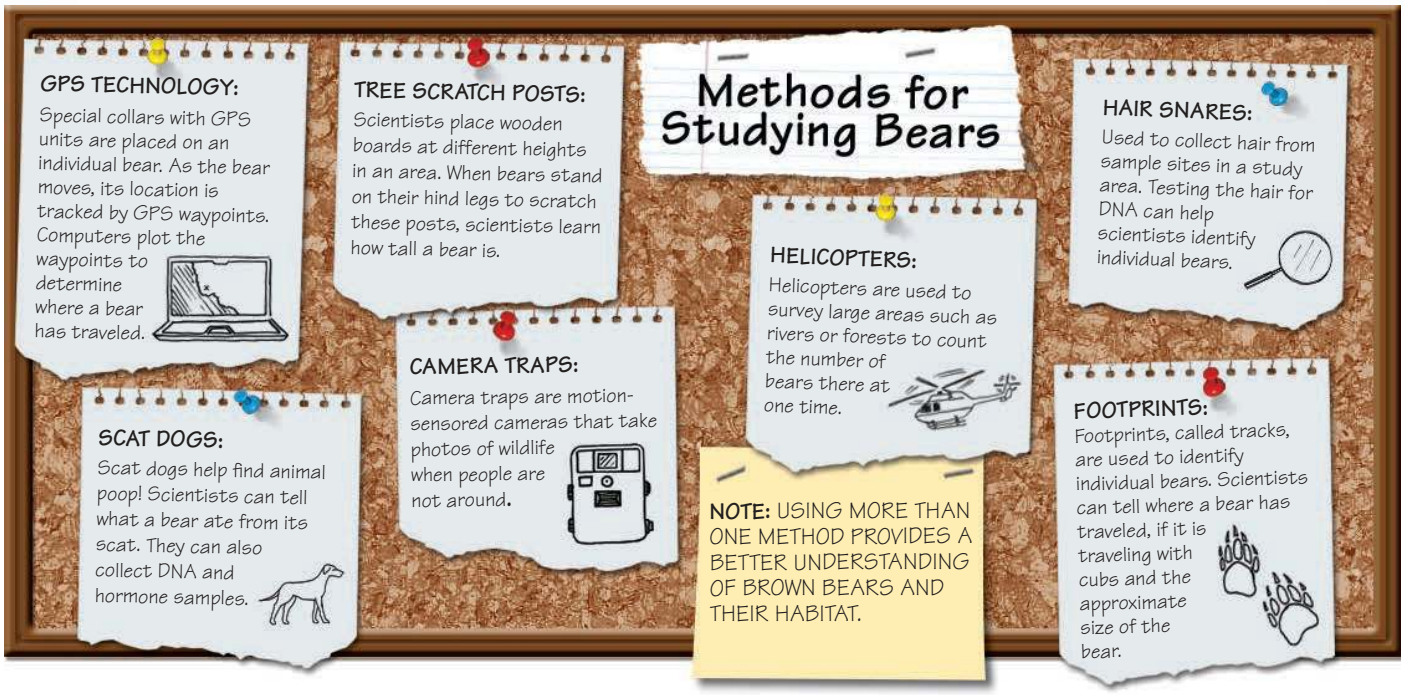
CONNECT WITH NATURE

Write to your local or state representative asking them to support laws that protect wildlife!

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Studying Brown Bears Worldwide

Scientists from around the world use different methods to study bears. Read each note describing methods for studying bears on the bulletin board below. Then decide the best study method that will help answer the Research Questions.



Research Questions: I want to...

- **Know the size of an adult brown bear.**

  The methods I would use are: _____

- **Examine the diet of a brown bear living in the forest.**

  The methods I would use are: _____

- **Find out if a female brown bear is traveling with cubs.**

  The methods I would use are: _____

- **Count the number of bears fishing along a very long River.**

  The methods I would use are: _____

- **Determine the home range of an adult bear.**

  The methods I would use are: _____

- **Collect DNA samples from an individual bear.**

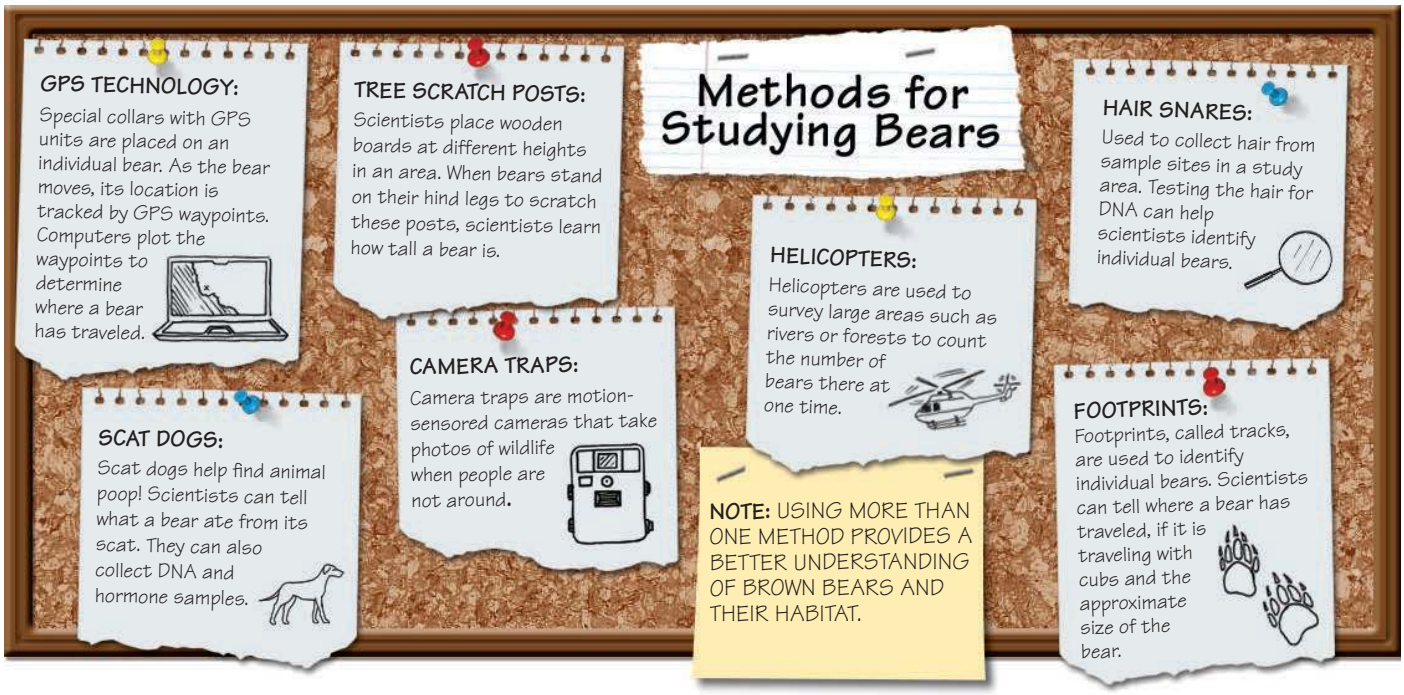
  The methods I would use are: _____

CONNECT WITH NATURE

Be an animal researcher at home! Decide what technology or tools you need and then go outside to learn more about the wildlife in your backyard.

Studying Brown Bears Worldwide

Scientists from around the world use different methods to study bears. Read each note describing methods for studying bears on the bulletin board below. Then decide the best study method that will help answer the Research Questions.



Research Questions: I want to...

- **Know the size of an adult brown bear.**

  The methods I would use are: *Tree scratch posts, footprints*

- **Examine the diet of a brown bear living in the forest.**

  The methods I would use are: *Scat tracking dogs and camera traps*

- **Find out if a female brown bear is traveling with cubs.**

  The methods I would use are: *Footprints, camera traps and helicopters*

- **Count the number of bears fishing along a very long River.**

  The methods I would use are: *Footprints and helicopters*

- **Determine the home range of an adult bear.**

  The methods I would use are: *GPS technology, tracks and tree scratch post*

- **Collect DNA samples from an individual bear.**

  The methods I would use are: *Hair snares and scat dogs*

CONNECT WITH NATURE

Be an animal researcher at home! Decide what technology or tools you need and then go outside to learn more about the wildlife in your backyard.

10 How can I safely visit bear country?

GRADE LEVEL
2-3

SUBJECT AREAS
History
Science
Social Studies

BACKGROUND INFORMATION
Pages 17-19

VOCABULARY: Bear-resistant, ecosystem, threat

STUDENTS WILL BE ABLE TO...
- Identify what camping items could attract a brown bear
- Discuss how to avoid attracting brown bears when camping
- Design a flier to promote bear safety for those visiting or camping in bear country

WHAT YOU NEED
- Activity Sheet 1: How can I safely visit bear country?
- Activity Sheet 2: Bear Aware Flier
- Sample brochures for reference:
  - **National Wildlife Federation** (http://www.nwf.org/~/media/PDFs/Regional/Northern-Rockies NRNRCGBBearBrochurePOINTERSpmd.pdf)
  - **Highway Wilding** (http://www.rockies.ca/files/HW_InfographicPrintVersion.pdf)

LEARNING ACTIVITIES

1. Ask the class if anyone has ever been camping. Where did you go camping? What did you bring on your camping trip? Student's answers will vary, but should include food, water and shelter. Discuss how camping items could attract animals and become a **threat** to both people and bears. What types of things could attract a brown bear to your campsite?

2. Distribute Activity Sheet 1. Students should cross out the items in the campsite that could attract a brown bear and circle the items that would be safe to bring. *The items in the campsite that could attract a brown bear are a grill with food, open trash bin, a bowl of pet food, a picnic basket with food and a campfire.* What is similar about all of these items? *All of these items are food related, and are things that a brown bear could smell.* Remind students that brown bears have a strong sense of smell and would be attracted to even the slightest of odors. *Items that would be safe to bring are a bear-resistant garbage can, a bear-resistant food storage container, and a backpack hung on a tree.* Why are these items safe to bring to the campsite? *All of these items are in some way* ***bear-resistant.*** *The garbage can and the food storage container have been specifically designed to seal in odors and to be safe from bears. A backpack hung in a tree is harder for a bear to reach.*

3. Distribute Activity Sheet 2. Each student should create a flier for people camping or visiting in bear country. The flier highlights the items discussed in Activity Sheet 1. You can distribute a copy of the brochures from National Wildlife Federation (http://www.nwf.org/~/media/PDFs/Regional/Northern-Rockies/NRNRCGBBearBrochurePOINTERSpmd.pdf) and Highway Wilding (http://www.rockies.ca/files/HW_InfographicPrintVersion.pdf) to each group as a reference.

   a. As part of their flyer, students should list the items that could attract a bear to a campsite, and also draw an example of a safe food storage container.

   b. Then have students show locations within the Park where it's safe to observe brown bears.

   c. Have students describe creative ways to protect brown bears. Students' lists will vary, but could include learning more about brown bears, spreading the word about brown bear safety, keeping wildlife habitats clean when visiting

10 How can I safely visit bear country?

or camping, and protecting yourself and bears by bear-proofing your campsite with safe trash bins, food storage, and even items like bear bells.

WRAP UP & CHECK FOR UNDERSTANDING

Wrap up the lesson and check for understanding using the following questions:

- **What threats do people pose to brown bears?** *Brown bears face a variety of threats on a daily basis. Deforestation, development of roads and highways, improper trash disposal, and proximity to humans are their biggest threats. People living near bears have control over many of these issues. If people live safely with bears by using bear-proof items and creating an environment to coexist with bears, these threats could be lessened.*
- **Why it is important to teach visitors how to safely visit bear country?** *Seeing brown bears in the wild is an amazing experience; however it should be done safely for both humans and brown bears. By camping and visiting safely, you ensure that both you and the bears are protected from harm. Be sure to research an area before visiting it to learn what types of animals may live there, and how you can keep them and you safe.*

EXTENDING THE LESSON

- **HISTORY, SOCIAL STUDIES:** Explain to students that people and bears have been sharing space in Alaska for many years. Just as we observe animals in the wild today, people in the past had their own ways of appreciating and incorporating these animals into their culture. Visit "Looking Both Ways: Heritage and Identity of the Alutiiq People of Southern Alaska," an online exhibit by the Smithsonian National Museum of Natural History, the Alaska Native Heritage Center and the Alutiiq Museum (http://www.mnh.si.edu/lookingbothways/data/frames.html). Have students explore the online exhibit to learn how the Alutiiq people incorporated animals into their culture. How were they incorporated into their daily life? Have students look for artifacts that could have animal representation. What were these artifacts used for? Have students write a short story about how animals and culture in Alaska has changed over time.

RESOURCES

For Students

- American Bear Association. *Camping*. http://www.americanbear.org/awareness/camping-hiking.html
- National Park Service. *Bear Safety in Alaska's National Parklands*. http://www.nps.gov/lacl/planyourvisit/upload/bearsafe.pdf
- National Geographic. *Katmai National Park*. http://travel.nationalgeographic.com/travel/national-parks/katmai-national-park/
- Project Wild. *Be Bear Aware!* https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=59892&inline=1

For Teachers

- Montana Fish and Wildlife. *Be Bear Aware*. http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/beBearAware/videos.html
- Smithsonian National Museum of Natural History. *Alutiiq Villages*. http://www.mnh.si.edu/lookingbothways/
- Katmai National Park. *Katmai National Park*. http://www.nps.gov/katm/index.htm
- Katmai National Park. *Map of Katmai*. http://go.nps.gov/katmai_maps

CONNECT WITH NATURE

MAKE SURE STUDENTS UNDERSTAND THE IMPORTANCE OF DOING THEIR RESEARCH BEFORE VISITING A PARK! Learning more about the animals that live there and how to be safe when visiting are good practices for students to develop and share with their family and friends. Students can even visit a Ranger's Post or Headquarters at the beginning of their trip to pick up a field guide for the animals that live in the park and to learn how to observe animals safely from a distance.

How Can I Safely Visit Bear Country?

Help this family make their campsite safe by circling the things below that are good practices and placing an **X** on the wrong practices.

CONNECT WITH NATURE | Do your research before you visit a park! Learn more about the animals that live there and how you can be safe when you visit.

ACTIVITY SHEET 1
GRADES 2-3
ANSWER KEY

How Can I Safely Visit Bear Country?

Help this family make their campsite safe by circling the things below that are good practices and placing an **X** on the wrong practices.

CONNECT WITH NATURE | Do your research before you visit a park! Learn more about the animals that live there and how you can be safe when you visit.

Bear Aware Flier

Design a flier to hand out to people visiting bear country. Include ways that they can camp safely, and also learn about brown bears. Cut out your flier when finished to share with the class!

Example:

CONNECT WITH NATURE | Do your research before you visit a park! Learn more about the animals that live there and how you can be safe when you visit.

11 How can people live safely with bears?

GRADE LEVEL
4-6

SUBJECT AREAS
Art
Science
Social Studies

BACKGROUND INFORMATION
Pages 17-19

VOCABULARY: Development, fragment, human-wildlife conflict, threat, wildlife corridor

STUDENTS WILL BE ABLE TO...
- Describe the term human-wildlife conflict
- Analyze how human changes to an environment can be a threat to brown bears
- Discuss human-brown bear conflict from the perspective of a community member
- Illustrate at least one solution for reducing the conflict between people and brown bears

WHAT YOU NEED
- Activity Sheet 1: What threats do brown bears face?
- Scenario Cards: Akire Town Hall Scenarios

LEARNING ACTIVITIES

1. Ask students to predict what challenges large animals like brown bears might face in the wild. How might other animals and naturally occurring events in their environment pose a **threat**? How might a brown bear's size and space requirements be an advantage and/or disadvantage to their survival? How might brown bears and people compete for resources such as food, water and space? Record students' thoughts using flip chart paper or a whiteboard. Discuss and underline threats from natural causes such as predators, climate, competition from other bears and natural disasters such as avalanches. Then, introduce the term **human-wildlife conflict** and circle any related threats to brown bears. Save this list for use later on in the lesson.
2. Distribute a copy of Activity Sheet 1 to each student. Students should describe the threat to brown bears shown in each picture. Use the background information to discuss students' completed activity sheets as a class. Students should conclude that people are one of the primary threats to brown bears. How do the four threats depicted on the activity sheet compare with the list of other types of threats compiled in step one?
3. Explain that because people pose the greatest threat to bears, living safely with bears is an important conservation issue. Divide the class into ten groups and give each group one of the Akire Town Hall Scenarios. Students should assume the identity of the person or stakeholder group represented in their scenario. Give students time to read and think about how their person or stakeholder group feels about the presence of brown bears in Akire. Are their feelings generally positive or negative and why? What are the needs of their person or stakeholder? Is there anything they are trying to accomplish?
4. Set up a discussion by explaining that you are the Mayor of Akire and you have called a town hall meeting to discuss the recent conflicts between brown bears and people in Akire. As the Mayor, you are interested in coming up with a way for everyone to live safely with bears, since brown bears are an icon for the town and it is a special privilege to have them nearby. You would like to hear from all members of the community on this issue. First, have one member from each group present their viewpoint. Then, use the following questions to guide the debate among community members (groups should continue to personify their given scenario throughout the debate):
   a. Should the community allow a highway to be built through brown bear habitat to accommodate the Akire Shipping Company? Why or why not?
   b. Should Bea Honeypotts and Farmer Frank stop beekeeping, growing apples and raising chickens, since these all seem to attract bears? Why or why not?
   c. Should all of the brown bears be relocated to a different town? Could there be any challenges with moving the bears? Why or why not?

11 How can people live safely with bears?

d. Would everyone agree to let NuGrowth, Inc. clear land near the major brown bear food source to make room for more housing and a mall? Why or why not?

e. Would anyone be willing to change their current behaviors to accommodate the bears? How could they change their behaviors?

f. Is coexistence with bears possible given what we know about human and bear behavior? Why or why not?

5. As a community, record and identify the main sources of conflict between people and bears in Akire (hint: the issues should fit into one of the four threat categories depicted on Activity Sheet 1). Students should begin to see that there are many complexities in human-wildlife conflict. Rearrange students into new small groups of four to five to create community conservation proposals that will meet the needs of all the townspeople while also protecting brown bears. Groups should be comprised of a mixture of members and stakeholders (i.e. the three "Farmer Fred" students should be in separate groups). Distribute a copy of the brochures from National Wildlife Federation (http://www.nwf.org/~/media/PDFs/Regional/Northern-Rockies/NRNRCGBBearBrochurePOINTERSpmd.pdf) and Highway Wilding (http://www.rockies.ca/files/HW_InfographicPrintVersion.pdf) to each group. Students should use these resources to learn how people can live safely around bears. Solutions include bear-proof garbage bins and dumpsters, electric fencing, **wildlife corridors**, selective land **development** and bear-proofing backyards.

6. Have each group create a proposal that celebrates bears in the community but makes the town of Akire bear-safe. Each group should present their proposal to the community as part of a follow-up town hall meeting. The community will vote on which proposal best meets the needs of everyone involved while also protecting brown bears in the area. Create a map, mural or multi-media presentation based on the elected proposal to show how the people of Akire have chosen to live safely around bears.

WRAP UP & CHECK FOR UNDERSTANDING

Use the following questions to wrap up the lesson and check for understanding:

- **Would you like to live in a community that was close to a bear ecosystem? Why or why not? How might your life in such a community be different from your life now?** *Answers will vary. Students should conclude that there are many behavioral changes people need to make in order to live safely with brown bears. Living in a community with bears would mean adapting to those behaviors in order to coexist with the animals.*

- **Describe human-wildlife conflict in your own words.** *Human-wildlife conflict is a situation where people and animals share a space and may come into conflict with one another.*
- **Analyze how human changes to an environment can threaten brown bears.** *Building roads and highways through an animal's habitat can cause several issues: roads can separate existing animal populations, making it hard for them to reach needed resources such as food and water. Roads can also limit the amount of space an animal has to move around, causing large animals like brown bears to compete with each other for resources. Roads can even limit the ability for animals to find a mate, which can ultimately reduce the number of animals in a population. Finally, animals are often struck by vehicles when crossing roads and highways which leads to injury and death. Clearing of land and human development can cause animals to lose their habitats or put animals and people in closer proximity to one another, increasing human-wildlife conflict. With bears living closer to people, they are often drawn to gardens, bird feeders, livestock and even garbage cans as food sources. This changes natural behavior, causing bears to lose their fear of people, putting both bears and people at risk.*
- **What must an animal do in order to survive human changes to their environment?** *Changes to an environment, like the building of houses and roads, can cause animals to lose some of their natural habitat and resources. All animals need food, water and shelter to survive. If one of these elements is impacted, the animal must adapt. Some animals may leave the area and some may adjust to the new conditions in the environment.*
- **Illustrate at least one solution for reducing the conflict between people and brown bears.** *Students' answers may vary, depending on the proposal they devised in step six of the lesson. Students should*

11 How can people live safely with bears?

conclude that conflict with brown bears may be avoided by using bear-proof garbage bins and dumpsters, adding electrical fencing around fruit and vegetable gardens, livestock and bee hives, implementing a wildlife corridor, selectively choosing which land to develop on and bear-proofing backyards (ie. avoiding bird feeders until winter, picking ripe fruit, cleaning grills, keeping pet food indoors and securing garbage cans).

EXTENDING THE LESSON

- **ART, SCIENCE:** Show students Living With Wildlife Foundation's "Bear-Resistant Products Testing" video (http://www.lwwf.org/Bear-resistant%20products%20testing.htm) and Montana Fish and Wildlife's tips on "Bear Proof Camping" (http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/beBearAware/videos.html). In pairs or small groups, have students come up with their own design for a bear safe container or trash can. Provide each group with paper and markers or colored pencils to draw their design. Ask each group present their design to the class and explain how it works, what it would be used for and what materials they would use. As an option, have students create a three dimensional model of their design using recycled cardboard or shoe boxes, tape, string or other easily accessible supplies.
- **ART, LANGUAGE ARTS, SCIENCE, SOCIAL STUDIES:** Ask students to interview their neighbors or other community members to investigate sources of human-wildlife conflict in their own community. What animal do you live near that might come into conflict with people? How do people's actions impact this animal? How does this animal impact people? (Birds, alligators, coyotes, raccoons, possums, termites, etc). Research and propose a solution to help people and wildlife life safely in your area. Create a flyer or poster to educate people in your community about living safely with animals.
- **SOCIAL STUDIES:** Have small groups research how Alaskan policies toward bears have changed over the course of the state's history. Why have these changes taken place? What roles did scientific knowledge and technological advances play in supporting these changes? What roles did the development of environmentalism as a movement and tourism as a business play in supporting these changes? What effects did population growth have on Alaska's bear policies? What do you predict for the future of Alaska's bears?

RESOURCES

For Students

- Alaska Department of Fish and Game. *Be Bear Aware Coloring Book.* http://www.adfg.alaska.gov/static/species/livingwithwildlife/bears/pdfs/bearawarecoloring.pdf
- Get Bear Smart Society. http://www.bearsmart.com/becoming-bear-smart/home
- National Wildlife Federation. *BEARS: Pointers for Peaceful Coexistence*. http://www.nwf.org/~/media/PDFs/Regional/Northern-Rockies/NRNRCGBBearBrochurePOINTERSpmd.pdf
- Highway Wilding. *Wildlife Monitoring and Collaborative Research in the Canadian Rocky Mountains Brochure*. http://www.rockies.ca/files/HW_InfographicPrintVersion.pdf

For Teachers

- Alaska Department of Fish and Game. *Living with Bears*. http://www.adfg.alaska.gov/index.cfm?adfg=livingwithbears.main
- Conservation Corridor. *Banff National Park*. http://www.conservationcorridor.org/2012/10/banff-national-park/
- Highway Wilding. *Wildlife Monitoring and Collaborative Research in the Canadian Rocky Mountains*. http://www.highwaywilding.org/index.php
- Idaho Department of Fish and Wildlife/Idaho ProjectWILD. *Bear Issues*. http://idahoptv.org/dialogue4kids/season7/bears/issues.cfm
- Living with Wildlife Foundation. *Bear-Resistant Products Testing Program*. http://www.lwwf.org/Bear-resistant%20products%20testing.htm
- Montana Fish, Wildlife and Parks. *Be Bear Aware Video Gallery: Bear Proof Camping*. http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/beBearAware/videos.html
- Wildlife Conservation Society. *Grizzly Bear Conservation.* http://www.wcs.org/saving-wildlife/bears/grizzly-bear.aspx
- Yosemite National Park. *Bear Awareness: Be Bear Aware.* http://www.yosemitepark.com/bear-awareness.aspx

YOU CAN HELP | **ENCOURAGE STUDENTS TO SPREAD THE WORD** about the threats that brown bears face and how we can help. We can all inspire others to care for and protect these incredible animals and the places they call home.

What Threats Do Brown Bears Face?

Each of the images below depicts a threat to brown bears. These images are not from the movie. Use the lines provided to identify and describe them in your own words.

THREAT: _____

_____

_____

THREAT: _____

_____

_____

THREAT: _____

_____

_____

THREAT: _____

_____

_____

CONNECT WITH NATURE

Be an animal researcher at home! Decide what technology or tools you need and then go outside to learn more about the wildlife in your backyard.

Disneynature BEARS
Celebrate Earth Day 2014 · In Theatres April 18

Akire Town Hall Scenarios

Cut out and distribute one of the scenarios to each small group. Students should adopt and represent the perspective in their scenario during the town hall discussion.

Farmer Frank

"My family has two large apple orchards. We also raise chickens. I have had issues with bears for years. They are always eating my crops and stealing my chickens for food! Lately, the bears have done so much damage that I'm not making enough money to support my family. I wish these bears would just go away. Otherwise, I may need to sell my farm and find another job."

Bea Honeypotts

"I have the largest number of beehives in the area. I make money selling honey and beeswax candles. But these brown bears are really getting on my nerves. They steal the honeycomb and ruin the beehives. I tried to put up a chain-link fence, but the bears just knocked it down. Their hunger for honey is costing me money. I wish these nosy bears would just leave my bees alone!"

Iamtak Family

"We recently moved to Akire. Bears have been coming into our yard several times a week. They eat from our bird feeder, gobble up pet food from our dog's outdoor bowl, have smashed our barbecue grill and destroyed our garbage cans. We have tried to scare the brown bears away but they keep coming back. Our kids are scared to play outside. This is too much – we need help dealing with these bears!"

The Sitkas

"The wildlife in Akire is amazing! We have brown bears pass through our yard but we enjoy watching them from a distance. We know not to put anything in the yard that might be food for bears since this can change their behavior. Some of our neighbors see the bears as a nuisance, but we think they are smart and powerful animals. The bears should be protected; people are causing the problem."

Wanda Hampton

"I am the General Manager of Akire's waste management facility. I oversee all of the garbage, recycling and composting centers. We have a real problem with brown bears here. They ruin garbage cans and destroy dumpsters. Now, they are entering the landfills in search of food. Their presence on our property is a real safety concern. I need to solve this issue before people or bears get hurt."

Akire Town Hall Scenarios

Cut out and distribute one of the scenarios to each small group. Students should adopt and represent the perspective in their scenario during the town hall discussion.

Phillip Foreman

"I am the owner of Akire Shipping Company. We built a new facility on the other side of the town. Currently, there are no direct roads to connect our locations and the company is spending too much on travel. I need to build a highway connecting my two facilities. The most direct and least expensive path will cut directly through bear habitat. What's the harm in adding a highway if it saves money?"

Ranger Rita

"Bears are an icon animal. That's why I've made it my mission to teach people how to live safely with bears. But now, the Akire Shipping Company wants to build a highway through brown bear habitat. Large roads limit how much room bears have and may stop them from reaching food and water sources, finding den sites or finding a mate. The Akire Shipping Company needs to find a different route."

NuGrowth, Inc.

"We are from NuGrowth, Inc., dedicated to helping small towns grow. We have found some affordable land that would be perfect for developing a shopping mall and more housing. This will create new jobs and boost Akire's economy. But the land is near a major brown bear food source so building here could bring bears closer to people. There are other places to build, but land is more expensive."

Officer Genie

"People and bears sure cross paths a lot around here! As a police officer, I often respond to car accidents. You would be surprised how many of these accidents happen when cars hit brown bears crossing the road. These accidents cause major damage to the vehicle and can even cause human injuries. Of course, it's never good for the bear either. I would like to find a way to make roads safer for people and bears."

BEARly There! Ecotours

"I own BEARly There! EcoTours. My company works closely with park rangers like Rita to take visitors on bear watching trips. I make sure my visitors obey all of the park rules. I am concerned that all of the recent conflict between people and bears will scare tourists away. No tourists means I lose my business and our town loses money. There has to be a way that people and bears can live safely together."

Akire Community Proposal

Plan for living safely with brown bears

We have decided to:

❑ Live safely with brown bears ❑ Relocate the brown bears ❑ Make no changes to the town

ROADS

1. We are going to make changes to the current roads: ❑ Yes ❑ No

   If so, list the changes _____

   _____

RESIDENTS

2. We are going to build a road through brown bear habitat for Phillip Foreman: ❑ Yes ❑ No

3. We suggest these changes for the following people:

   Farmer Fred: _____

   Bea Honeypotts: _____

   Iamtak Family: _____

WASTE MANAGEMENT

4. We are going to make changes to the waste facilities: ❑ Yes ❑ No

   If so, list the changes _____

   _____

DEVELOPMENT

5. We are going to build a mall and housing near a brown bear food source:

   ❑ Yes, we will save money ❑ No, we will pay more to build elsewhere

CONNECT WITH NATURE

Tell others about the threats to brown bears and how we can help. You can inspire others to care for and protect these incredible animals and the places they call home.

Glossary

Adaptation: *a trait that helps an animal or plant survive in its environment*

Alpha: *the highest ranking individual in a group*

Amino acid: *the building blocks of proteins; found within DNA*

Bear-proof*: an object that bears cannot open or break*

Biodiversity: *the variety of life forms on Earth; includes three major types of biodiversity: species, genetic and ecosystem diversity*

Camera trap: *a special automated camera equipped with a motion-detecting beam that is used to capture pictures of wild animals*

Camouflage: *a physical adaptation that helps an organism blend in with its environment*

Canine teeth: *sharp, pointed teeth situated in the upper and lower jaws of an animal's mouth*

Carnivore: *an animal that eats mostly meat*

Carrion: *a dead and decaying animal*

Cell: *the basic structural and functional unit of all living organisms*

Chromosome: *a threadlike structure containing DNA found within the nucleus of living cells*

Consumer: *an organism that does not make its own food; primary consumers eat producers, secondary consumers can eat primary consumers and producers, and tertiary consumers can eat secondary and primary consumers and producers*

Coordinate: *a group of numbers that indicates a point or plot on a map*

Data: *a collection of facts, numbers or text used to represent ideas or conditions*

Decomposer: *a living organism at the base of a food web that breaks down and recycles nutrients from dead animals and plants*

Den: *a shelter in which a resting bear spends the winter months*

Deoxyribonucleic acid (DNA): *the genetic material, made up of proteins called amino acids, found within most living organisms*

Development: *land use planning that includes the building of structures, such as roads, houses, schools and shops, for human use*

Digits: *the name for an appendage found on an organism's hand or foot; fingers and toes*

Ecosystem: *the interaction of all living and nonliving components found within a given area*

Energy: *ability to do work; energy can take many forms including heat and light. Plants make energy using sunlight through the process of photosynthesis; animals obtain energy from the food they eat*

Fat layer: *located just below a the skin, this layer gives a bear enough energy to survive the winter*

Food chain: *the way energy is transferred from producers to consumers in an ecological community*

Food web: *an interconnected network of feeding relationships in an ecological community*

Footprint: *the indentation or outline left by an organism's foot on an impressionable surface such as sand, mud or snow*

Forage: *to look or search for food items*

Forest: *a large area of land covered in dense trees and other plants*

Fragment: *an area of land that has been separated from a larger portion of the surrounding ecosystem by a natural or human-made barrier*

Fungus: *a multi-cellular organism that is neither a plant nor an animal that gets its energy from breaking down other organisms; a mushroom is an example of a fungus*

Global positioning satellite (GPS): *a system of navigational satellites that can provide accurate data on an object's location*

Habitat: *a place where plants and animals have everything they need to survive*

Hair: *threadlike strands that grow from the skin of mammals and other animals*

Hair snare: *a device used by scientists to retrieve hair samples from bears to study their genetics*

Herbivore: *an animal that eats plants*

Herd: *a large group of animals living together in the same area*

Home range: *the main area in which an animal lives and travels*

Human-wildlife conflict: *a negative interaction between people and animals that impacts them or their environment*

Incisors: *narrow-edged teeth found in the front section of the mouth specialized for cutting and tearing*

Latitude: *imaginary lines used to measure the distance north or south from the equator*

Learned behavior: *actions or mannerisms that are not instinctive but are taught through experience*

Longitude: *imaginary lines used to measure the distance east or west from the prime meridian*

Meadow: *a grassy area of land typically found near a body of water*

Molars: *flat teeth used for grinding found in the back of a mammal's mouth*

Navigate: *to plan and direct a course using measurements or maps*

Niche: *the role each living thing has in its habitat*

Nucleus: *the control center of an animal cell*

Nursing: *the method that mammals use to feed their young*

Omnivore: *an animal that eats plants and animals*

Pack: *a group of wolves that live and hunt together*

Paw: *an animal foot that contains both claws and footpads*

Population: *all of the animals living in an area*

Predator: *an organism (usually an animal) that eats other animals for food*

Prey: *an animal that is food for another animal*

Producer: *an organism that is able to make its own food (i.e., plants, some algae)*

Range: *the geographical area in which an animal population is found*

River: *a large channel of water flowing to or from another body of water*

Salt marsh: *a coastal wetland that is flooded and drained as salt water is brought in by the tides*

Scat: *animal waste; dung*

Scavenger: *an animal that feeds on food captured or acquired by another animal*

Scent marking: *a body odor, scent from a gland, urine or scat deposited in a geographic area to communicate with others of the same species*

Scientist: *a person who studies the living or non-living world*

Sedge: *a grass-like herb often found in salt marshes that grows in wet ground near water*

Species: *a group of very similar organisms; individuals in the same species can mate to produce fertile offspring*

Teeth: *enamel coated structures found in vertebrates used for biting and chewing*

Territory: *an area defended by an animal*

Threat: *indication of impending harm; something that negatively impacts the survival of an organism*

Tracking collar: *a special band of material placed around the neck that is equipped with a device to record an animal's movement throughout its habitat*

Tree scratching: *a behavior in which brown bears use their front claws to score the trunks of trees in order to mark their territory and communicate with other bears*

Wildlife corridor: *a habitat that connects wildlife populations separated by human-made structures such as roads or housing developments*