

American Bison



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How to Get Started



The American bison was the largest mammal living on the largest ecosystem in North America. It dictated the functioning of the prairie ecosystem as well as the functioning of human culture for almost 10,000 years. Over the course of one generation, the animal, the ecosystem, and the human culture were nearly exterminated. Today, the bison is a symbol of the capacity for human destruction but also our efforts to preserve and restore.

Materials contained in this kit are geared toward grades 4- 5 and correlated to Kansas State Education Standards for those levels. However, you may use the materials in the trunk and this booklet as you deem appropriate for your students.

References to items from trunk will be in **bold print and underlined**. Graphics with a Figure Number referenced will have accompanying transparencies and digital versions on the CD. Watch for the following symbols to help guide you through the booklet:

All questions, comments, and suggestions are welcome and should be forwarded to:

Education Coordinator
Tallgrass Prairie NPRES
Route 1 Box 14, Hwy 177
Strong City, KS 66869
(620)273-8494



Indicates a class discussion point and potential writing activity.



Indicates further resources on the Web for extension learning.



Math Counts! Exercise for mental or written arithmetic.



Vocabulary Counts! New vocabulary that may need reinforcement.



Community Counts! Opportunity for verbal interaction with community members.

Please help us continue to share these treasures with other students by treating the trunk contents with respect.

Good luck and enjoy!

Curriculum Standards (Kansas)



The activities and materials in this trunk have been compiled to meet curriculum standards for the State of Kansas Department of Education.

<u>Lang Arts</u>	Std	Bench mark	A	B	C	D	E	F	G
Reading	1	4			•	•		•	
Literature	2	2				•			
<u>Math</u>	Std	Bench mark	A	B	C	D	E	F	G
# and Comp	1	4			•				
<u>Science</u>	Std	Bench mark	A	B	C	D	E	F	G
Life Science	3	1	•	•	•				
	3	2		• (3rd-4th)					
	3	4		• (5th-7th)	• (5th-7th)				
	3	5		• (5th-7th)	• (5th-7th)				
Science in Personal and Env't'l Perspectives	6	2					•	•	
History and Nature of Science	7	2	• (5th-7th)						
<u>Social Studies</u>	Std	Bench mark	A	B	C	D	E	F	G
Civics-Govt		1							•
Economics		1						•	
		2						• (5th grade)	
		3						•	
Geography		1			•				
		4					•	•	
		5				•	•		•
History		1				•	•	•	
		3							• (4th grade)
		4			•				
<u>Visual Art</u>	Std	Bench mark	A	B	C	D	E	F	G
	4	1				•			•
	4	2				•			•
	4	3				•			•

Curriculum Standards (National)



National Science Education Standards

Standard C (Life Science): The characteristics of organisms, Life cycles of organisms, Organisms and environments.

Standard F (Science in Personal and Social Perspectives): Characteristics and changes in populations, Types of resources, Changes in environments, Science and technology in local challenges

Standard G (History and Nature of Science): Science as a human endeavor

National Council of Teachers of English

Standard 1: Students read a wide range of print and non - print texts to build an understanding of texts, of themselves, and of the cultures of the United States and the world; to acquire new information; to respond to the needs and demands of society and the workplace; and for personal fulfillment.

Standard 3: Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.

Standard 6: Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and non - print texts.

National Center for History in the Schools:

Standard 1A: The student understands family life now and in the recent past; family life in various places long ago.

Standard 1B: The student understands the different ways people of diverse racial, religious, and ethnic groups, and of various national origins have transmitted their beliefs and values.

Standard 3B: The student understands the history of the first European, African, and/or Asian - Pacific explorers and settlers who came to his or her state or region.

Standard 3E: The student understands the ideas that were significant in the development of the state and that helped to forge its unique identity.

Standard 4E: The student understands national symbols through which American values and principles are expressed.

Standard 6A: The student understands folklore and other cultural contributions from various regions of the United States and how they help to form a national heritage.

Standard 8B: The student understands changes in transportation and their effects.

Lesson A: Bison or Buffalo?



Objectives:

- Students will understand the taxonomic origin of the American bison.
- Students will understand why the same animal is often referred to by many different names.
- Students will be introduced to scientific taxonomy.

Materials:

___ Disney's Stitch

Curriculum Standards:

- Life Science B1
"The student will model structures of organisms and relate functions to the structures." (5th -7th)
"The student will develop knowledge of organisms in their environment." (3rd- 4th)
- History and Nature of Science B2 (5th -7th)
"The student will research contributions to science throughout history."



What is this animal and what does it have to do with Kansas? In fact, the first bison in Kansas were not like the ones you might see in North America today. The ancestors of today's modern bison migrated to North America hundreds of thousands of years ago across the Bering Land Bridge between Siberia and Alaska. They weighed almost 3,000 pounds and their horns spanned over 6 feet! They shared the continent with other giant-sized extinct mammals like mastodons, mammoths, American lions, and giant sloths. Eventually they died out and it was their smaller relatives who survived to become the largest land mammals on the continent.



(Figures A1 & A2)

But what do we call this animal?

A buffalo?
A bison?

This large mammal has had many

names over the years. Lakota Indians called it “tatanka.” French explorers called it “le boeuf” because of its resemblance to oxen. Later, early American settlers and explorers thought of the animal’s resemblance to the water buffalo and started to call it “buffle” and “buffelo.” Over time, “buffalo” became an accepted name as well as “bison.”

Why the confusion? Why so many different names for one animal?



Community Counts! Ask someone in your community or at a local college to help you translate “bison” in another language.

Most animals have a *common name* that comes from the local language. The animal you know as “dog” in English is called “perro” in Spanish and “chien” in French. There are as many common names for “dog” as there are languages in the world. Sometimes there can be many common names even within one language!



Vocabulary Counts!
Scientific name



Learn more about Carolus Linnaeus, inventor of the scientific naming system

by visiting:
<http://www.ucmp.berkeley.edu/history/linnaeus.html>



What do you call the large cat that used to live in the prairies of the United States? Do you call it a puma, a mountain lion, or a cougar?

This, as you can guess, becomes confusing when scientists from different countries want to speak to each other about the same animal. So, every animal gets a name when it is first discovered or described by science. This is called a *scientific name* and it usually comes from the Latin or Greek language and is printed in italics. The system of scientific naming we have today was invented by Carolus Linnaeus in the 17th century. The scientific name includes two parts. The genus – which comes first – is like your family name. The species – which comes second – is like your first name. For example, the scientific name for a dog is *Canis domesticus*.



Which is the genus and which is the species?

Many scientific names get their roots from the scientific names of related animals. The scientific name for buffalo, *Bison bison*, comes from a wild ox that lived in ancient Europe with the name *Bos bison*. The term “bison” itself actually comes from an eastern European root for “stinking animal” which refers to the odor of the wild ox during the rut.



What about you? You probably have a first name and a last name. Do you have a middle name? What about a nickname? Where do your names come from?

Although they can sound very complicated, scientific names are really just descriptions in another language or references to the person who did the naming.

Canis domesticus (dog) - house dog
Canis latrans (coyote) - barking dog

Show the picture of Disney's Stitch from the trunk. Make a list of all of its physical characteristics. Make a list of its behavioral characteristics (if you are familiar with them). What animal do you think it might be related to? Come up with your own common and scientific name for the creature based on your observations.



Lesson B: Natural History of the Bison



Objectives:

- Students will understand how bison have adaptations to help them survive in their environment.
- Students will understand the bison life cycle.

Materials:

- ___ Chest protector
- ___ Fake fur
- ___ Balaclava
- ___ Mitten with wood blocks (2)
- ___ Bottle of Pepto on belt
- ___ Fly swatter
- ___ Glasses with trowel
- ___ Helmet
- ___ Plastic forks on headband
- ___ Life cycle cards (7)
- ___ Venn diagram cards (20)
- ___ Venn diagram poster

Curriculum Standards:

- Life Science B1
“The student will model structures of organisms and relate functions to the structures.” (5th -7th)
“The student will develop knowledge of organisms in their environment.” (3rd- 4th)
- Life Science B2
“The student will observe and illustrate the life cycles of various organisms.” (3rd- 4th)
- Life Science B4
“The student will identify and relate interactions of populations of organisms within an ecosystem.” (5th -7th)
- Life Science B5
“The student will observe the diversity of living things and relate their adaptations to their survival or extinction.” (5th -7th)



Vocabulary
Counts!
Adaptation

The American bison is the largest land mammal in North America. Since it is native to this continent, it has developed some special *adaptations* to help it survive in its environment. An adaptation is a special skill or physical attribute that living things develop over time to help them survive and thrive in their habitat. These may be adaptations for defense against predators, adaptations to take advantage of food resources, and adaptations to withstand weather and environmental hazards.



Brainstorm some adaptations you think an animal would need in order to survive and thrive in a tallgrass prairie.

“Build” a bison from a student in the class using the following items from the trunk:

Catcher’s chest protector: The thick hide of the bison keeps it warm and protects it from predators.

Balaclava: Bison, unlike cattle, face and walk *into* winter storms so they have thick fur in front of their faces.

Fake fur: Bison fur is thick and warm in the winter but can be molted or shed in the summer to cool the animal.

Mittens with wood blocks: Sturdy hooves help the bison dig away snow from the ground in the winter and are a formidable weapon against predators.

Bottle of Pepto on belt: In order to process cellulose in grasses, bison stomachs have four chambers which contain microorganisms to help in digestion.

Glasses with trowel: Bison have wedge - shaped noses that they use to push away snow when grazing in winter.

Helmet: Bison have very thick skulls which they use for protection and as a weapon against other bison during the rut.

Plastic forks: Both male and female bison have horns for protection.

Fly-swatter: Bison (and humans) use this appendage to deflect insects!

Finally, gather all of the students together in a clump to show the adaptation of living in a herd for protection.



Humans don’t have any of the right equipment on their bodies to keep them alive on the prairie. How do we adapt to live in this environment? What technology do we employ?



Not only do bison have a number of handy physical characteristics, they have some remarkable athletic abilities as well.

Bison Olympics:

An American bison can run 35 miles per hour which is the equivalent of the 100-meter dash in 6.4 seconds.

The human world record is 9.8 seconds (Donovan Bailey, 1996)

I can do the 100-meter dash in _____ seconds.

The way the bison's legs and feet are constructed, it would be the equivalent of doing the 100 yard dash on your tip-toes.

I can do the 100 yard dash on my tip toes in _____ seconds.

An American bison can do a standing long jump of 4.3 meters.

The human world record is 3.47 meters (Ray Ewry, 1904)

I can do a standing long jump of _____ meters.

An American bison can do a standing high jump of 1.8 meters.

The human world record is 1.65 meters (Ray Ewry, 1900)

I can do a standing high jump of _____ meters.



Although the abilities and physical characteristics of the bison are remarkable by human standards, this animal is not so different from many others in the animal world. In fact, the American bison is so closely related to other members of the cow family, that it has been bred with domestic cattle to produce a reproductive animal called a “beefalo.”



Can you name a few ways you are the same? What about a few ways you are different?

Remove the **Venn diagram and cards** from the trunk. Hang the Venn diagram and distribute the cards to the students. Which of the attributes go with the bison, which with human, and which are shared? Check your answers below.

Bison only:

- Runs on four legs
- Can walk within minutes of birth
- Gestation period 9 1/2 months
- Usually weaned off mother’s milk by 6 months
- Adult males can weigh up to 2,200 pounds
- Herbivore(eats plants only)
- Can digest grass
- Can run up to 35 mph

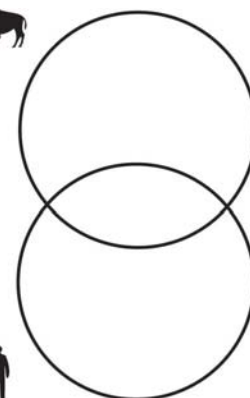


Bison and humans:

- Gives live birth
- Males are usually larger than females
- Usually gives birth to one offspring at a time
- Males can grow beards
- Native to North America

Humans only:

- Omnivore (eats plants and animals)
- Runs on two legs
- Gestation period 9 months
- Usually weaned off mother’s milk by 1 year
- Can walk within one year of birth



(Figure B1)

All living things go through changes in their lives. Humans start out as infants, grow into toddlers, children, teenagers, and finally adults. The cycle from birth to death in modern humans usually takes about 80 years.

In the wild, the bison life cycle takes less than 20 years. This means that it has less time to grow, learn, and pass along its genes to later generations. The animal must gain the skills to survive and reproduce at a much earlier age.



Community Counts! When does a human become an “adult?” Ask different members of your family or community.



Put the life cycle cards in the order you think they should go. Check your answers below.



Calves are born usually in the late spring. They are usually reddish in color and weigh between 30 and 40 pounds. Because they must survive on the open prairie, newborn bison calves are also *precocial*, meaning that they can stand and walk within minutes.



Calves nurse with their mothers for the first 6 months of life before they are weaned onto a diet of grass. Male calves can become completely independent of their mothers at this point, and females usually do a few months later.



Young bison in adolescence may remain with their mother's herd or venture out to find another. During this time, they learn social behaviors and establish themselves in the social order of the herd.



Females become reproductively mature at about 2 years old, males at about 5 years old.



The breeding season, also known as the rut, begins in late summer and can run until September. Males will "tend" a chosen female by staying near to her and fighting other males that attempt to challenge.



Adult bison are the largest land mammals in North America. Males can weigh up to 2,200 pounds and females up to 1,200 pounds.



In the wild, the American bison lives around 12-15 years. In captivity, they can live to be almost 30.

Lesson C: Bison and Their Habitat



Objectives:

- Students will examine the effect of bison grazing on prairie habitat.
- Students will explore changes that have been made to prairie habitat and consequent bison range reduction.
- Students will understand food webs.

Materials:

___ Ball of string

Curriculum Standards:

- Reading B4
“The student comprehends a variety of texts (narrative, expository, technical, and persuasive.)
- Numbers and Computation B4
“The student models, performs, and explains computation with whole numbers, fractions, and money including the use of concrete objects in a variety of situations.”
- Life Science B1
“The student will model structures of organisms and relate functions to the structures.” (5th -7th)
“The student will develop knowledge of organisms in their environment.” (3rd- 4th)
- Life Science B4
“The student will identify and relate interactions of populations of organisms within an ecosystem.”
- Life Science B5
“The student will observe the diversity of living things and relate their adaptations to their survival or extinction.” (5th - 7th)
- Geography B1
“The student uses maps, graphic representations, tools, and technologies to locate, use and present information about people, places, and environments.”
- History B4
“The student engages in historical thinking skills.”



Vocabulary Counts!
Habitat

Every animal lives in a space called its *habitat*. Your habitat may be a big city or a small town or the country. A habitat has to provide everything you need to live – food, shelter, and water. Bison can live in several different kinds of habitat, but they are best adapted to live in grasslands. Look at this picture from Tallgrass Prairie National Preserve.



(Figure C1)



Is it good habitat for bison? Why or why not? Identify the parts of this scene that would make good habitat for bison.

Bison thrive in grasslands like the one in Tallgrass Prairie National Preserve.

After the recession of glaciers in the last Ice Age, the mid-continental United States began to develop a huge expanse of grasslands that covered over 400 million acres! This became the largest ecosystem in North America and home to millions of bison.

Grass is like hair. It grows back after you get a haircut because the growing part, the part that is alive, is down under your skin. Prairie grasses have particularly deep roots, too, which help to keep the plant alive even when the tops are clipped off. Mowing, grazing, and burning all help to stimulate new growth on the prairie. In fact, the Native Americans not only called prairie fire the “red buffalo” but they also used fire to create good grazing habitat for herds of bison in the spring.

Heidi Natura, Conservation Research Institute



(Figure C2) Underground root systems of prairie plants



Community Counts! When is the burning season in your community?

Ask a local rancher when they burn their pasture and why.

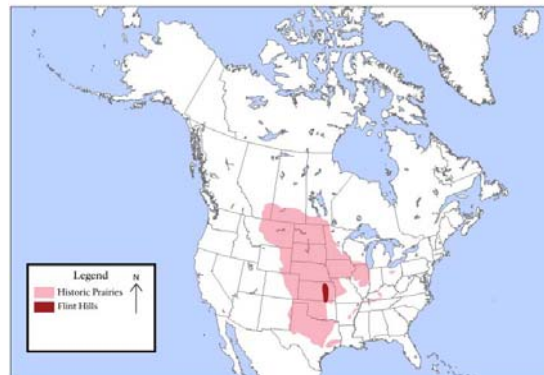


Vocabulary Counts!
Biodiversity

When bison graze, they snip off the tops of different grasses and flowering plants, thereby stimulating new growth. They also create little miniature habitats in the places where their cup-shaped hooves have been. In many cases, grazing bison on a prairie will increase the *biodiversity* -- or number of different plants -- on that prairie.



Look at this map of North America. The light red shaded region shows where prairie grasslands used to be.



(Figure C3)



Do you think that today this same area could be good bison habitat? Why or why not?



Math Counts!
How many acres of tallgrass prairie are left today? How many acres were lost?

From its previous range of over 400 million acres, less than 4% of the original tallgrass prairie ecosystem survives. Most of it was plowed under with the westward expansion of white settlers. The Flint Hills region was too rocky to plow and so Tallgrass Prairie National Preserve is one of the last big pieces of tallgrass prairie that still exists in the United States.

Use the states transparency (Figure C4) or a reference map to study the bordering states to the North, South, East, and West of the Flint Hills. Then, take away the transparency. Can you name them? Can you name other states that used to be prairie? What are some of the natural boundaries that limit the range of prairie in North America?



Millions upon millions of bison lived on the North American continent. They lived in many habitats including mountains and forest edges from Mexico to Alaska. Accounts like those on the following page were common and provide some of our only evidence of historic bison populations. Remember, these were days before photography and video so we rely on written accounts and artwork to paint us a picture of what life was like.



When you read, consider the following:
What are the advantages and disadvantages of this? Is there room for exaggeration? Is there any way to check or verify these accounts?



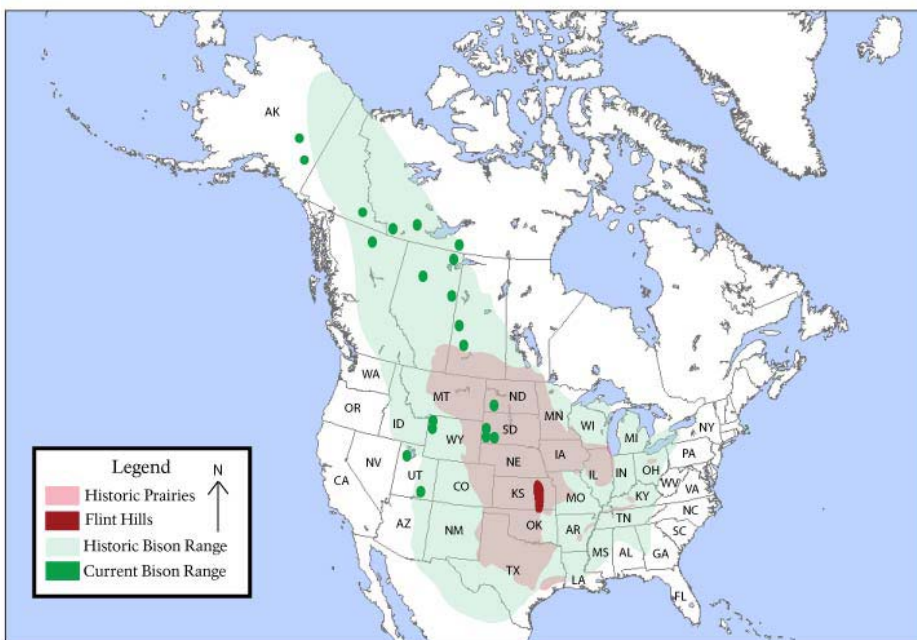
“From the N to S the ground is entirely covered by them & appears quite black. I never saw such amazing numbers together before. I am sure there was some millions in sight as no ground could be seen for them in that compleat semicircle & extending at least 10 miles.” -Peter Fidler, 1792

“...as numerous as the locusts of Egypt...” - Duncan M’Gillivray (1794)

“...it is impossible to describe or even conceive the vast multitudes of these animals that exist even now...” - John James Audubon (1844)

“The country was one robe.” - signed by an Indian in 1892

Overlay the **graph paper transparency (Figure C6)** with the **bison distribution map (Figure C5)**.



(Figure C5)



How many boxes did the original range fill?

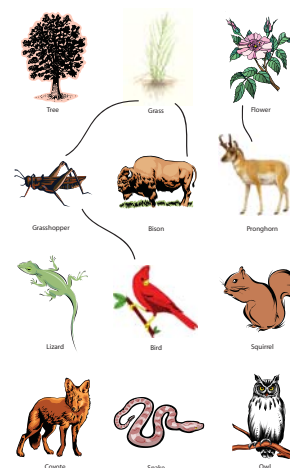
How many does it fill now? How much was lost?

Bonus: What *percentage* was lost?



Vocabulary Counts!
Ecosystem
Food web

Bison did not live alone on the vast grasslands of North America. In fact, they were part of a community of plants and animals called an *ecosystem* where everything was connected to everything else in some way. This is also called a *food web*.



(Figure C7)

Display or distribute the **food web diagram (Figure C7)**. Draw connections between the different elements on the prairie and label how they interact. A few examples have been added already. How many more can you find? Be creative!



Learn more about the black-footed ferret and its connection to other prairie plants and animals at:
<http://www.blackfootedferret.org/>

You are part of a food web, too! When you bite down on a chicken sandwich, you are eating meat from a bird which ate grain which grew from sun and water and air.

When one prairie plant disappears, it can lead to the disappearance of 10 to 30 species of insects. Each of those insects is food to another insect or an animal like a bird or reptile. When prairie dog towns were destroyed to make room for agriculture and ranching, black-footed ferrets (which eat prairie dogs almost exclusively) disappeared.

Stand in a circle to create your own food web. Hold onto the end of the **ball of string** and toss the ball (underhand, please!) to someone else in the circle. When you toss the ball, name a plant or animal that lives in the prairie grasslands. That person holds onto the string and tosses the ball to someone else, naming another plant or animal in the food web. When everybody has a hold of a part of the web, give a slight tug and see who feels it. The web should be taut enough so that almost everybody in the circle will feel something. Does anything in the ecosystem live in isolation? Do we as human beings?



U.S. Fish and Wildlife Service

Lesson D: American Indians and Bison



Objectives:

- Students will understand that bison played a large role in the material daily life of American Indians.
- Students will understand the significance of the bison in American Indian cultural traditions.

Materials:

- ___ Scapula
- ___ Horn
- ___ Bladder
- ___ Hair
- ___ Tanned hide (with fur)
- ___ Tanned hide (without fur)
- ___ Sinew
- ___ Shopping cards (18)

Curriculum Standards:

- Reading B4
“The student comprehends a variety of texts (narrative, expository, technical, and persuasive.)
- Literature B2
“The student understands the significance of literature and its contributions to human understanding and culture.”
- Geography B5
“The student understands the effects of interaction between human and physical systems.”
- History B1
“The student uses a working knowledge and understanding of individuals, groups, ideas, developments, and turning points in the age of exploration.” (5th)
“The student understands the significance of important individuals and major developments in history.” (4th)
- Visual Art Standard 4
“Understanding the visual arts in relation to history and cultures.”



Vocabulary
Counts!
Natural resource
Renewable
Non-renewable

No other animal was as important in the life of the American Indians as the American bison. It was a renewable natural resource that was present in almost every aspect of daily life. This one animal provided food, shelter, clothing, weapons, tools, and medicine. Anywhere you went in a native village or hunting camp, you would not have been more than a few feet from a product of the American bison. For breakfast you may have eaten bison meat, cooked over a fire from bison chips, sitting on a mat of bison hide. The bison was as integral to their lives as electricity is in ours.

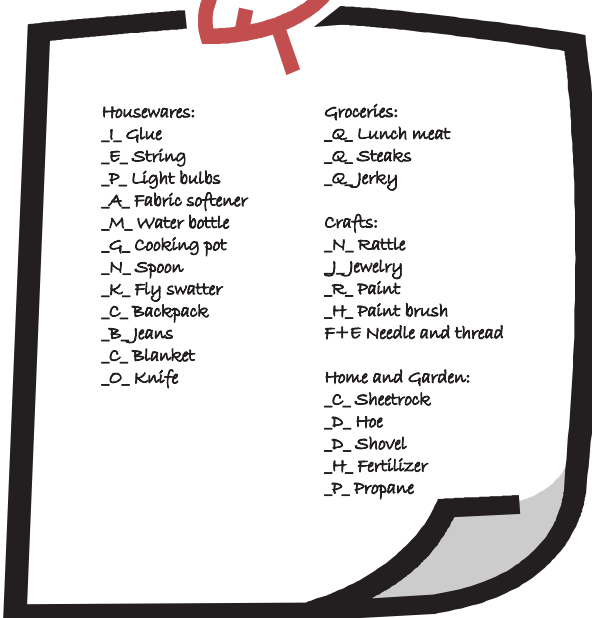


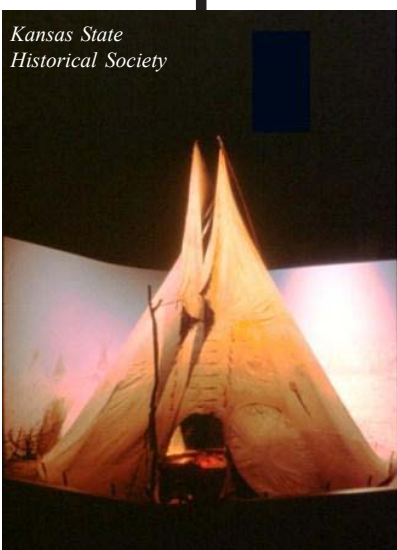
Think of your breakfast routine. How has electricity played a role? (Power for your refrigerator, stove, or toaster? Power to manufacture your chair, table, and utensils? Power to drive the car that brought the groceries home from the store?)

(Figure D1)



Time to go shopping at the Bison General Store! “Stock the shelves” by displaying the **bison parts and cards**. Use the **shopping list (Figure D1)** and check off which item could be supplied by which bison part. Check your answers below.





Some tribes, especially those who lived in the western part of the great plains where it is drier and harder to farm, spent their entire summers following bison herds. They relied on horses to transport all of their belongings so they lived in teepees -- homes that could be assembled and disassembled quickly.

(Figures D2 & D3)



Other tribes, like the Kansa who lived in the wetter eastern portion of the grasslands, built permanent settlements and lived in grass or bark lodges. These tribes farmed corn and other foods to supplement their diet but they still depended on bison for many of their everyday needs.



What do you think are the advantages and disadvantages of these two lifestyles? Which would you prefer? Why?



Vocabulary Counts!
Mythology

Because it played such a huge role in the lives of the American Indian, the bison was an important mythological, cultural, and spiritual symbol. When a buffalo was killed, a ritual or ceremony was performed to give thanks to the animal for giving its life so that the humans could live. The animal was honored as a figure of wisdom and strength and power and human beings aspired to achieve “buffalo wisdom.” Often, the mother figure in Plains mythology is referred to as the “Buffalo Woman.” A central myth of many Plains Indians is that of the White Buffalo Woman who brings the people the peace pipe and instructions for performing sacred rituals. In many stories, bison could speak to and interact with other animals and humans.



“Once, long ago, all things were waiting in a deep place far underground. There were the great herds of buffaloes and all the people, and the antelope too, and wolves, deer and rabbits - - everything, even the little bird that sings the *tear-tear* song. Everything waited as in sleep.

Then the one called Buffalo Woman awoke, stretched her arms, rose and began to walk. She walked among all the creatures, past the little *tear-tear* bird, the rabbits and all the rest and through the people too, and the buffaloes. Everywhere as she passed there was an awakening, and a slow moving, as when the eyes were making ready for some fine new thing to be seen. Buffalo Woman walked on in the good way, past even the farthest buffaloes, the young cows with their sleeping yellow calves. She went on to a dark round place that seemed like a hole and she stood there a while, looking. Then she bowed her head a little, as one does to pass under the lodge flat, and stepped out. Suddenly the people could see there was a great shining light all about her, a shining and brightness that seemed blinding as she was gone.

And now a young cow arose and followed the woman, and then another buffalo and another, until a great string of them was following, each one for a moment in the shining light of the hole before he was gone, and the light fell upon the one behind. When the last of the buffaloes was up and moving, the people began to rise, one after another, and fell into a row too, each one close upon the heels of the moccasins ahead. All the people, young and old and weak and strong went so, out through the hole that was on Pahuk, out upon the shining, warm and grassy place that was the earth, with a wide river, the Platte, flowing below, and over everything a blueness, with the *tear-tear* bird flying toward the sun, the warming sun. The buffaloes were already scattering over the prairie, feeding, spreading in every direction toward the circle that is the horizon. The people looked all around and knew this was their place, the place upon



which they would live forever, they and the buffalo together.”



- 1.) Who is the Buffalo Woman?
- 2.) What is the significance of light and dark in the story?



“Painted Buffalo Hide”
X-32481, Denver Public Library

(Figure D4)

- 3.) How do you think this kind of creation legend would affect the way the Pawnee saw the world? How would it affect how they saw the buffalo?



American Indians often recorded the details of their lives by painting pictures on bison hides. A “winter count” depicted the events of the past year or several years.

Check out “Tracking the Buffalo” at:
<http://www.americanhistory.si.edu/kids/buffalo/>

You will have to use your detective skills to figure out the story that is being told on the buffalo hide.

Try your own “winter count” painting on a piece of paper or a paper bag!

Lesson E: The Early Buffalo Hunt



Objectives:

- Students will understand that changes in technology have led to different hunting techniques through time.

Materials:

- ___ Spear point
- ___ Metal arrowhead
- ___ .50 calibre bullet shell

Curriculum Standards:

- Geography B4

“The student understands how economic, political, cultural, and social processes interact to shape patterns of human populations, interdependence, cooperation, and conflict.”

- Geography B5

“The student understands the effects of interaction between human and physical systems.”

- History B1

“The student uses a working knowledge and understanding of individuals, groups, ideas, developments, and turning points in the age of exploration.” (5th)

“The student understands the significance of important individuals and major developments in history.” (4th)

- Science in Personal and Environmental Perspectives B2

“The student will understand the impact of human activity on resources and environment.” (5th -7th)

“The student will demonstrate an awareness of changes in the environment.” (3rd- 4th)



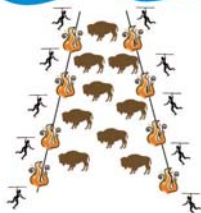
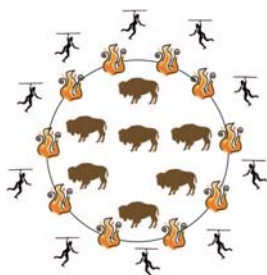
The hunting of bison has taken many forms over the centuries. Because of its immense size, dangerous horns, and thick hide, the bison has very few natural predators. Wolves and bears attack the young, sick, or elderly members of a herd but humans posed the only real threat to the herd as a whole. Even with primitive technology, early human hunters in North America could kill hundreds of bison in a single day.



Imagine you are an early human hunter on the plains with nothing but a spear. What strategies would you use to hunt safely and successfully?

Pass around the **spear point** so that everybody has a chance to look and feel.

(Figures E1, E2, E3)



"Buffalo Chase in Winter" by George Catlin
Smithsonian American Art Museum

Spears could be used only in close proximity and at great risk to the hunter! To simply sneak up on a herd and take down an animal was very difficult and very dangerous. Bison can run up to 35 miles per hour and they have sharp horns and powerful feet. It would take many spears thrown very hard and at just the right points to take down a full-sized bison.

People quickly realized that the best strategy was to drive the bison into an area that would either cripple or trap the animals for hunting. Many times, fire was used to drive the animals in a certain direction.

- Sometimes the entire village would help to encircle a small herd so that the hunters could strike more easily.
- A ravine, narrow canyon, or river made an effective trap.
- Driving a herd into deep snow slowed them down enough for humans to gain an advantage.

Try a game of tag using these strategies. Set up boundaries in the shape of a circle, a narrowing canyon, or have the "bison" hop on one leg to imitate being snow-bound.



Vocabulary Counts!
Buffalo jump



One of the most effective and dramatic hunting methods was to use a “buffalo jump” which was a steep cliff off of which a small herd of bison could be driven. A runner would attract the



For more information, visit:
<http://www.head-smashed-in.com/>

attention of the leading bison. Others would flank the herd on either side, waving robes and yelling. The runner would sprint toward the jump, leap off the edge, and hide in a small crevice while the rest of the herd would plummet off the edge before him. The rest of the tribe would be waiting at the bottom of the cliff to kill and butcher the fallen animals.



Vocabulary Counts!
Atlatl

Later, native technology introduced the atlatl (spear-thrower) and the bow and arrow. These tools allowed the hunter to shoot with greater accuracy and at a farther distance. The hunt became much safer. Trade with European settlers introduced metal arrowheads into tribal life.

When the Spanish explorers arrived in North America, they brought with them a new weapon that was quickly adopted in the buffalo hunt -- the horse!

Pass around the metal arrowhead so that everybody gets a chance to look and feel.



Community Counts! Is there a stable in your community or someone who rides horses? Interview them about what horses are capable of (how fast can they run? how much weight can they pull?)

Horses provided speed, agility, and protection that the buffalo hunters had never experienced before. Many tribes adopted the horse into their culture very quickly and to the point where it became a central part of village life.



When guns became readily available, the ease and efficiency of the bison hunt improved once again. One could hide upwind on a hilltop and shoot the bison from far away. Some became skilled at reloading their rifles while on horseback.

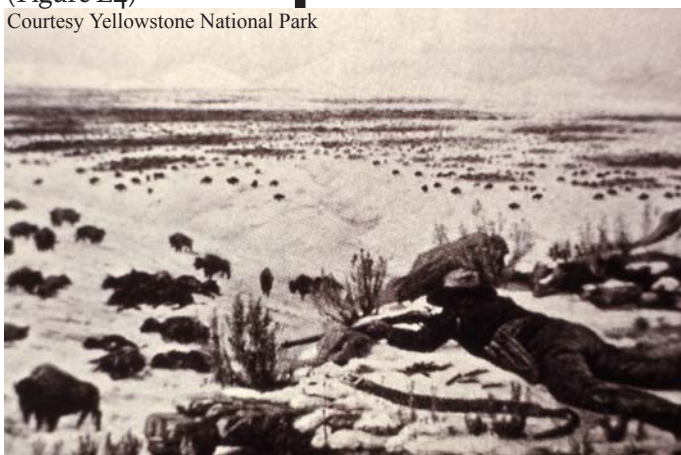
Pass around the **.50 calibre-bullet** so that everybody gets a chance to look and feel. Read the following account outloud.

“In the midst of the flying herd, where the uproar and the dust are thickest, it never wavers for a moment; he drops the rein and abandons his horse to his furious career; he levels his gun, the report sounds faint amid the thunder of the buffalo ...

A practiced and skillful hunter, well mounted, will sometimes kill five or six cows in a single chase, loading his gun again and again as his horse rushes through the tumult. An exploit like this is quite beyond the capacities of a novice...With a bold and well trained horse the hunter may ride so close to the buffalo that as they gallop side by side he may reach over and touch him with his hand; nor is there much danger in this as long as the

buffalo’s strength and breath continue unabated; but when he becomes tired and can no longer run at ease, when his tongue lolls out and foam flies from his jaws, then the hunter had better keep at a more respectful distance; the distressed brute may turn upon him at any instant; and especially at the moment when he fires his gun.”

(Figure E4)
Courtesy Yellowstone National Park



Francis Parkman, The California and Oregon Trail (1849)

Lesson F: Destruction of the Bison



Objectives:

- Students will understand the precipitous decline of bison populations during westward expansion.
- Students will understand the economic principles at work during the height of the bison hunt.
- Students will understand that the population of bison in North America neared extinction.

Materials:

- ___ Hide cards (10 bags, 10 cards each)
- ___ Cash tokens (10 bags, \$50 each)

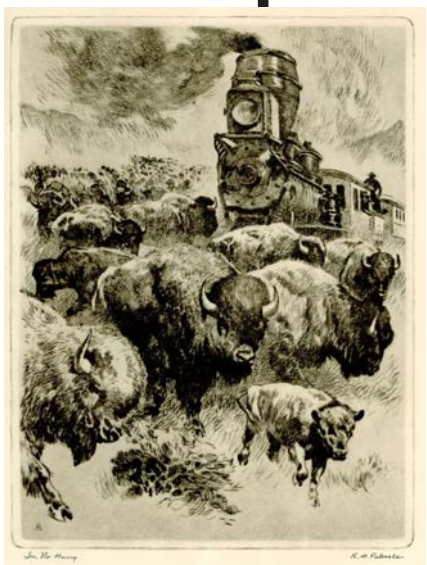
Curriculum Standards:

- Reading B4
“The student comprehends a variety of texts (narrative, expository, technical, and persuasive.)”
- Economics B1
“The student understands how limited resources require choices.”
- Economics B2
“The student understands how the market economy works in the United States.” (5th grade)
- Economics B3
“The student analyzes how different incentives, economic systems and their institutions, and local, national, and international interdependence affect people.”
- Geography B4
“The student understands how economic, political, cultural, and social processes interact to shape patterns of human populations, interdependence, cooperation, and conflict.”
- History B1
“The student uses a working knowledge and understanding of individuals, groups, ideas, developments, and turning points in the age of exploration.” (5th)
“The student understands the significance of important individuals and major developments in history.” (4th)
- Science in Personal and Environmental Perspectives B2
“The student will demonstrate an awareness of changes in the environment.”



Exact numbers are hard to pin down, but estimates of historic bison populations range from 20 to 60 million.

American Indians had been hunting the bison for centuries and undoubtedly contributed to some of the population's decline, but it was not until white settlement that the population crashed. Not only were the animals seen as a resource to be harvested, white settlers hoping to build cities and farms and railroads saw the bison as an obstacle to be removed.



(Figure F1)



How would a large bison population get in the way of westward expansion? (Farms, railroads, ranches, Indians populations?)

Destroying the bison population also contributed to the defeat of the American Indians during the violent history of the Indian Wars. Without reliable bison hunting, traditional village life could no longer function.



Imagine a spaceship lands in your town and suddenly turns off all of the electricity. How would that affect your life and the daily functions of your town?

Native tribes were eventually forced to move to reservations and rely on food and clothing provided by the U.S. government.

Many considered bison hunting great sport and railroad lines advertised that bison could be shot from passenger cars. The growing markets of this expanding nation also contributed huge demand for bison products. People wanted hides for coats and blankets, leather for belts in machinery, and tongues which were considered delicacies. A hide fetched between 1 and 5 dollars each in a time when an average worker might earn that much in an entire day! The expansion of the railroad lines made transporting these valuable goods even easier. Dodge City, Kansas became a major hub for bison product export.



(Figure F2)



Learn more about Dodge City's history at:
[http://](http://www.americanwest.com/pages/dodge.htm)

www.americanwest.com/pages/dodge.htm



Math Counts!
By Frank's estimate, how much was the entire herd worth? If he

could kill with only one bullet, what was Frank's profit on each animal? How many times over did he get his investment back? How much could Frank make in a month? How much in a year?

A buffalo hunter named Frank Mayer decided to cash in on the endeavor.

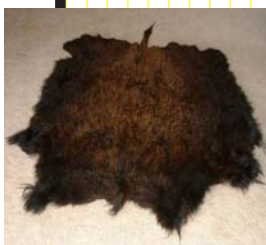
"When I went into the business, I sat down and figured that I was indeed one of fortune's children. Just think. There were 20 million buffalo, each worth at least \$3...At the very outside, cartridges cost 25 cents each, so every time I fired one I got my investment back... I could kill a hundred a day..."

Even the President of the United States at that time made only \$25,000 a year. Today, wages are almost 40 times what they were when Frank was hunting. He would have been the equivalent of a millionaire. The lure was undeniable.

However, intensive hunting created a scarcity of bison that cut into the profits of the hunt. While the bison were plentiful it was very profitable to hunt, but as they began to disappear, the hunters had to work harder and harder to bring in as many hides. By this time, the hides had also decreased in value .



Vocabulary Counts!
Scarcity



How would you do as a trader or hunter? Students should work in pairs with half of the pairs as hunters and half as Buyers. Hunters receive a **bag of 10 hide tokens**. Buyers receive a **bag of \$50 in cash tokens** . Let the students have 5 minutes to mill around the room, bartering and making deals with each other.

Play several rounds to simulate the passage of time. Let the students know that in each round, the value of the hide and the costs of hunting will change. After each round, find the true costs on the following page. Tell the buyers what the value of the hide is and tell the hunters the cost of their expedition. If buyers ends up with less cash than they start with, they are running a loss. If hunters have to pay more in expedition costs than they made in sales, they too are running a loss.



Was there anything the hunters or buyers could have done differently? What would've happened if there had been only a few hunters?



Round 1 (1820): There are fortunes to be made! The west is just beginning to be explored and bison are plentiful. Growing industry demands leather to run machinery!

Hide value: \$5

Expedition costs: \$20

Round 2 (1840): The bison are now extinct east of the Mississippi but there are still millions in the central plains and prairies. Demand is high.

Hide value: \$5

Expedition costs: \$22

Round 3 (1860): The demand for bison products is still fairly high, but the word has gotten out and there are more hunters on the plains than ever.

Hide value: \$4

Expedition costs: \$25

Round 4 (1870): This year, the industry for bison products has reached it's peak! Thousands of hides are being shipped on the Kansas Pacific Railway every day! There are so many hides hitting the market, in fact, that they are losing value. Increased hunting activity as well as recreational shooting from railroad passenger cars has decreased the bison numbers significantly.

Hide value: \$3

Expedition costs: \$30

Round 5 (1874): After only a few years, the market has crashed. Bison have been hunted intensely in the last three years. The value of hide has dropped and finding large herds roaming wild is nearly impossible.

Hide value: \$1

Expedition costs: \$50

Round 6 (1886): The bison is all but extinct. A new law will be passed in a few years to make it illegal to kill wild bison, but one can hardly find the animals to begin with. The public, outraged by these developments, no longer has a taste for buffalo robe coats or blankets.

Hide value: \$0.25

Expedition costs: \$70



Frank's experience was much like that of other bison hunters.

“Within a year or a year and a-half after I got into the business — we hit what I now know is called diminishing returns. We called it a scarcity of buff. It was. The more he was hunted and hounded the wilder the buffalo became, and with, say, 5,000 rifles a day levelled at him, it wasn't long until there was very little him, or her, left to shoot.

So we had to spend more and more time in the wagons exploring one range after another. We didn't have Geiger counters or scout airplanes or even a dependable communications to tell us where we might find buff. We did it the hard way, riding miles and miles and miles in a stiff Mexican saddle over the uncharted plains, looking into every gully and prowling around every stream bed...

On my first two years, deducting interest on investment, overhead, and so forth, I barely came out even; I think my net for the two years was around \$2,800...Let some other men tell you about earning \$50,000, \$60,000 a year — I am telling the truth...The fact is that I earned little more than the average office worker of the day would have earned...And a little over \$100 a month is mighty poor pay for the financial and physical output, not counting liability to disease and violent death!

When I finally sold out and quit, I had less than \$5,000 on deposit, to show for nine years of hard work and sweat.”

Frank Mayer, from Archives of the West



Organized hunting parties killed hundreds of bison in a day. Well-known professional buffalo hunters like “Buffalo Bill” Cody killed over 4,000 in just a few months. Hunting from the passenger cars along the railroads became a popular sport

among settlers and travellers. By 1833 the bison was extinct east of the Mississippi. By 1879 the bison was extinct in Kansas. By 1889, there were only about 1,000 in the entire United States.



The bison population had crashed and taken with it the American Indian population as well. Bison hides were all but gone and bison meat had been left rotting on the plains and prairies. Some turned to harvest the bones left to sell for fertilizer. Others hunted the wolves and coyotes which fed heartily on bison carcasses.



(Figures F3 , F4)



Read Frank's passage below. How do you think he felt while he was hunting? How do you think he felt when it was over? Would you have done anything differently?



“The buffalo didn’t belong to anybody. If you could kill them, what they brought was yours. They were walking gold pieces... Was I not lucky that I discovered this quick and easy way to fortune? Adventurous? No more than shooting a beef critter in the barnyard... It was a harvest. We were the harvesters... One by one we runners put up our buffalo rifles, sold them, gave them away, or kept them for other hunting, and left the ranges. And there settled over them a vast quiet, punctuated at night by the snarls and howls of prairie wolves as they prowled through the carrion and found living very good. Not a living thing, aside from these wolves and coyotes stirred.

The buffalo was gone.

...Maybe we served our purpose in helping abolish the buffalo; maybe it was our ruthless harvesting of him which telescoped the control of the Indian by a decade or maybe more. Or maybe I am just rationalizing. Maybe we were just a greedy lot who wanted to get ours, and [forget] posterity, the buffalo, or anyone else, just so we kept our scalps on and our money pouches filled. I think maybe that is the way it was.”

Frank Mayer, from Archives of the West

Lesson G: Bison Conservation Efforts



Objectives:

- Students will understand how conservation efforts and laws brought bison populations back from the brink of extinction.
- Students will understand the symbolic significance of the American bison in the United States.

Materials:

- ___ Buffalo cut - outs (4)
- ___ Symbols (4)
- ___ Blindfold

Curriculum Standards:

- Civics-Government B1
“The student understands the rule of law as it applies to individuals; family; school; local, state and national governments.”
- Geography B5
“The student understands the effects of interaction between human and physical systems.”
- History B3
“The student understands the significance of events, holidays, documents, and symbols that are important to Kansas, United States and World History.” (4th grade)
- Visual Art Standard 4
“Understanding the visual arts in relation to history and cultures.”



William Hornaday, 1889 (Figure G2)

The massacre of the bison population, called by many the “Great Slaughter,” shocked and saddened many people in this country and around the world. Some lawmakers pushed for rules to make the hunting of bison on public land illegal. Artists like George Catlin brought his images of the prairie landscape to the cities of the east coast and exposed the people there to the wonders of the west. Scientists like William Hornaday documented the destruction of bison



“Buffalo Chase” by George Catlin Smithsonian American Art Museum (Figure G1)

herds and brought his findings to the U.S. government. When it became clear that the wildlife community was on the verge of extinction, laws were passed to protect the few remaining herds of wild roaming bison.



Learn more about the first national park at: [http://](http://www.nps.gov/yell)

www.nps.gov/yell



Community Counts! There are fines today for poaching animals or

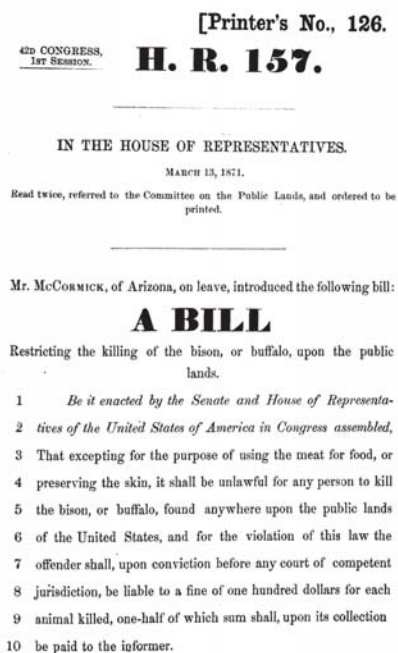
hunting out of season. Contact the local game warden to find out what they are.



Math Counts! How many times bigger is the current population of

bison in Yellowstone? Ten times? 100 times? 1,000 times?

One of the few places where bison still roamed wild was in the valley of the Yellowstone River in Wyoming. Yellowstone National Park, the first national park ever created, was established in 1872 in part to assure protection of the small bison herd. There were only about 40 animals to begin with. Although previous attempts to outlaw bison hunting had failed, the Lacey Act of 1894 succeeded in making the hunting of bison on public land punishable by a \$1,000 fine. The herd grew, public support grew, and the National Park Service grew to encompass over 300 units nationwide.



(Figure G3)

Today, Yellowstone National Park is home to about 4,000 bison and visited by almost 3 million visitors each year. There are approximately 125,000 bison roaming free in North America.



Visit them on the web at:

<http://www.naturalkansas.org/maxwell.htm>

<http://www.naturalkansas.org/sandsage.htm>

<http://climate.konza.ksu.edu/konza/>

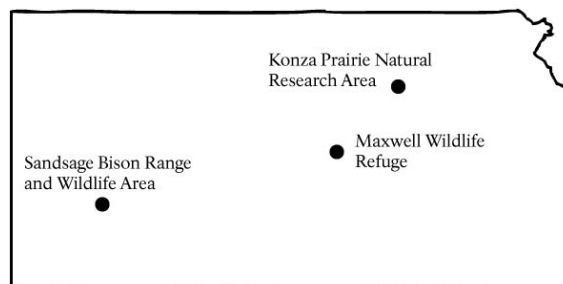


To see what happens when visitors get too close to wildlife, check out Yellowstone's

wildlife safety videos at: <http://www.nps.gov/yell/safetyvideos.htm>

There are several places to find bison grazing in Kansas today. Some commercial operations raise bison for meat and other products. Preserves keep bison as living members of the prairie ecosystem.

Here are a few places where you could catch a glimpse:



Maxwell Wildlife Refuge

Sandsage Bison Range and Wildlife Area (formerly known as Finney Wildlife Area)

Konza Prairie Natural Research Area

Tallgrass Prairie National Preserve will become home to a small herd of bison in the coming years.

The most important thing to remember when visiting bison is that they are wild animals -- not pets. Every year, visitors sustain injuries from bison attacks because they approach the animal too close. Always keep a distance of at least 25 yards from wild bison.

Although there are no wild roaming bison left in Kansas, the state's history is tied to the history of the buffalo. Kansas recognized this in 1955 by making the American bison the official state animal. The bison also appears in the Kansas state song "Home on the Range." and on the 2005 commemorative state quarter.

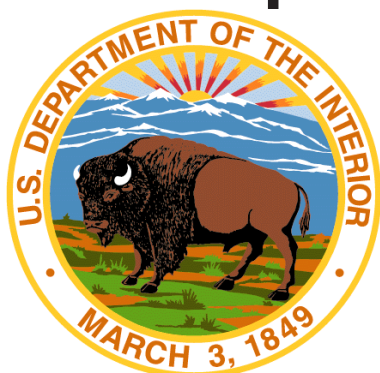


America finally decided to place this animal under its protection and, in return, the bison provided America with a symbol of its history, blunders, and redemption. Today, the bison represents many things to many people. It appears as school mascots, and emblems. The "buffalo nickel" was first introduced in 1913 and re - released with a new design in 2005.

Match the the **buffalo cut - out** with the **symbol** on which it appears. Then try a game of Pin - the - Buffalo - on - the - Symbol by **blindfolding** a student! Answers appear on the following page.



Buffalo Nickel



U.S. Department of the Interior



2005 Commemorative Kansas Quarter



National Park Service

Post - Trunk Activities



Congratulations! You've completed the American Bison traveling trunk! Please fill out the **Evaluation Form** enclosed in the trunk so that we can improve and expand this program.

Try a few of these follow-up activities:

Want to meet a bison up close? Take a field trip to a bison ranch or wildlife preserve near you! Or, visit the Kansas Museum of Natural History in Lawrence.

Create your own trunk or report about an animal that lives in your community. It could be a bird, a fish, or even a household pet!

The American bison plays a role in many of our national park stories. The following is a list of parks where bison roam freely:

Yellowstone National Park
Wind Cave National Park
Theodore Roosevelt National Park
Badlands National Park
Grand Tetons National Park

Write to one or more of these parks and ask them about the bison there. How many are there? What kinds of issues does the park face with the bison? What kinds of rangers are there and what do they do to protect and take care of the bison?

References and Additional Resources



Non-fiction

- Freedman, Russel. Buffalo Hunt. Holiday House, 1995. (Grade 4-6)
Patent, Dorothy Hinshaw. Buffalo: The American Bison Today. Clarion Books, 1993. (Grade 4-6)
Johnston, Marianne. Buffaloes. Powerkids Press, 1998. (Grade K-3)
Patent, Dorothy Henshaw. Prairies. New York: Holiday House, 1996. (Grade 4-5)
Patent, Dorothy Henshaw. Fire: Friend or Foe?. New York: Clarion Books, 1998. (Grade 2-8)
Robbins, Ken. Thunder on the Plains: The Story of the American Buffalo. Atheneum, 2001. (Grade 2-5)
Wallace, Marianne D. America's Prairies and Grasslands: A Guide to Plants and Animals. Fulcrum Publishing, 2001. (Grade 2-5)
Webber, Desiree. The Buffalo Train Ride. Eakin Press, 1991. (Grade 4-7)
Winner, Cherie. Bison (Our Wild World). Northward Press, 2001. (Grade 3-5)

Fiction

- Arnosky, Jim. Grandfather Buffalo. Putnam Juvenile, 2006. (Grade K-3)
Goble, Paul. Buffalo Woman. New York: Bradbury Press, 1984. (many titles by same author) (Grades K-3)
Lee, Evelyn. Bluestem Horizon: A Story of a Tallgrass Prairie. Soundprints, 1998. (Grade 1-4)
Roop, Peter. The Buffalo Jump. Rising Moon, 1996. (Grade 1-4)
Waldman, Neil. They Came From the Bronx: How the Buffalo Were Saved From Extinction. Boyd Mills Press, 2001. (Grade 2-5)
Wallace, Bill. Buffalo Gal. Holiday House, 1992. (Grade 5-9)

Reference materials

- Bee, James W. et al. Mammals in Kansas. University of Kansas, 1981. (Grade 9 - adult)
Catlin, George. George Catlin and His Indian Gallery. Smithsonian American Art Museum, 2002. (All ages)
Haines, Francis. The Buffalo: The Story of American Bison and Their Hunters from Prehistoric Times to the Present. University of Oklahoma Press, 1970. (Grade 9 - adult)
Krech, Shepard. The Ecological Indian: Myth and History. W.W. Norton and Company, 1999. (Grade 9 - adult)
Lott, Dale. American Bison: A Natural History. University of California Press, 2002. (Grade 9 - adult)
Sandoz, Mari. The Buffalo Hunters. University of Nebraska Press, 1954. (Grade 9 - adult)

Inventory



Please take the time to check all of the items in the trunk before and after use. If anything is missing or damaged, please contact us immediately.

Education Coordinator
Tallgrass Prairie
National Preserve
Route 1 Box 14, Hwy 177
Strong City, KS 66869
(620) 273-8494
tapr_interpretation@nps.gov

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- Activity booklet
 - Photo CD
 - Transparencies
 - Figure A1 (American bison)
 - Figure A2 (Asian water buffalo)
 - Figure B1 (Venn diagram)
 - Figure C1 (Tallgrass Prairie)
 - Figure C2 (Root systems)
 - Figure C3 (Prairies of N.A. map)
 - Figure C4 (States)
 - Figure C5 (Bison distribution)
 - Figure C6 (Graph paper)
 - Figure C7 (Food web diagram)
 - Figure D1 (Shopping list)
 - Figure D2 (Teepee)
 - Figure D3 (Grass lodge)
 - Figure D4 (Winter count)
 - Figure E1 (Hunting - circle)
 - Figure E2 (Hunting - ravine)
 - Figure E3 ("Buff. Chase in Winter")
 - Figure E4 (Man shooting bison)
 - Figure F1 ("In No Hurry")
 - Figure F2 (Buffalo robes)
 - Figure F3 (Bison skull pile)
 - Figure F4 (Bison hides)
 - Figure G1 ("Buffalo Chase")
 - Figure G2 (Map by Hornaday)
 - Figure G3 (Bill H.R. 157)
 - Evaluation Form
- Lesson A: Bison or Buffalo?
- Stitch
- Lesson B: Natural History of Bison
- Chest protector
 - Fake fur
 - Balaclava
 - Mitten with wood blocks (2)
 - Bottle of Pepto on belt
- Lesson C: Bison and Their Habitat
- Fly swatter
 - Glasses with trowel
 - Helmet
 - Plastic forks on headband
 - Life cycle cards (7)
 - Venn diagram cards (20)
 - Venn diagram poster
 - Ball of string
- Lesson D: American Indians and Bison
- Scapula
 - Horn
 - Bladder
 - Hair
 - Tanned hide (with fur)
 - Tanned hide (without fur)
 - Sinew
 - Shopping cards (18)
- Lesson E: The Early Buffalo Hunt
- Spear point
 - Metal arrowhead
 - .50 calibre bullet shell
- Lesson F: Destruction of the Bison
- Hide cards (10 bags, 10 cards each)
 - Cash tokens (10 bags, \$50 each)
- Lesson G: Bison Conservation Efforts
- Buffalo cut - outs (4)
 - Symbols (4)
 - Blindfold