

# Getting to Know Bison

*Theme: Bison are the largest mammals on the prairie. They have an interesting set of adaptations that allow them to survive the conditions present in the prairie environment. Bison have an important role in the prairie ecosystem.*

## Background

**Age**

5-7 years

**Time**

50 minutes

**B**ison are the largest land mammals in North America. They belong in the bovine family, along with cattle, sheep, and goats. All of these species have horns, feet with two toes, and a four-chambered stomach.

Male bison are called bulls. They can measure up to 7 feet at the shoulder and 10-12 feet long from nose to rump. More impressively, bulls can weigh up to one ton (2000 pounds)! Female bison are called cows and are a little smaller than bulls. Cows typically measure 5 feet at the shoulder, 7-8 feet in length, and weigh about 800 pounds. Both cows and bulls have horns. It is easiest to tell them apart by comparing size; remember, cows are smaller than bulls.

“Bison were often called buffaloes by the early settlers, and the nickname is still used today. But true buffaloes are relatives of the bison that live in Africa and Asia, the cape buffalo and the water buffalo. Only North American buffaloes are called bison.” (Winner, p.7)

The word “bison” comes from the animal’s scientific name, which is *Bison bison*. Some believe the word “buffalo” came from a distortion of the French word for cow, “les beoufs.”

Bison used to be found everywhere on the prairie, from Canada to Texas and the Rockies east into Indiana. Now they are found mostly in private herds and on public lands. You may be most familiar with herds in such places as Yellowstone National Park, Wind Cave, and Custer State Park. Although they are not seen in the phenomenal numbers of the mid-1800s, bison have made a comeback and are not considered a species of concern.

Bison are herbivores, meaning they eat only plants. More specifically, bison prefer to eat grass. Because they live in herds of large numbers, bison had to wander and keep moving to make sure there was enough grass for all members of the herd. A herd may travel 10-15 miles in one day in search of grass. The best grass is the new green shoots that pop up throughout the growing season. A special four-chambered stomach is needed to digest this grass. Bison are frequently observed



chewing their cud. They chew their food several times to extract as much nutrition as possible from it.

If you have ever been to the Black Hills, especially Custer State Park, you have probably seen the signs warning that buffalo are dangerous and you should not approach them. It is true that bison are dangerous. They have horns that are sharply tipped. These horns keep growing throughout a bison's lifetime and are never shed like the antlers of a deer. Each horn has a core of bone on the inside. The rest of the horn is made of the same material as your fingernails, only it is much more thick and dense in a bison's horns. Bison use their horns to protect themselves against predators, such as wolves, bears, and mountain lions. An attacked bison will charge, slash, and gore a predator if it can. It takes more than one predator at a time to successfully hunt a bison because of the bison's size and amazing ability to defend itself using its horns. Bison can run quickly. Their top speed is about 35 mph and they can maintain this speed for more than an hour! Other observations note that ten miles is about the maximum distance a bison can travel at this speed!

Many people think bison look lazy and clumsy because of the large hump in the shoulder area. This hump is composed of strong muscles that aid the bison in running. It holds up the bison's huge head when it is not eating. This muscle helps the front legs reach out farther for a longer and more efficient running stride.

The fur, or coat, of bison is unique. The head, shoulders, and front legs look shaggy, but the rest of the bison looks shorter and well trimmed. The fur is actually the key to a bison's survival. The thick fur on the front end keeps flies and other biting insects away because the fur and skin is too thick. The tail and back legs accomplish the same thing at the back end. The short, thinner hair at the hind end helps keep the bison cool during hot, shadeless prairie days. During blizzards and high wind episodes, bison travel and face headfirst into the weather. The thick coat makes this possible! The dark brown to almost black coat helps absorb heat from the sun on winter days. Like dogs, bison develop a thicker winter coat in the fall and carry it into spring. Then they shed and have a new lighter coat by the end of spring.

Bison have some interesting behaviors, and these behaviors are well studied. If there are trees in the area, bison will rub on them to relieve itching and help remove the shaggy winter coat. If there are no trees, bison run against boulders. They also wallow, meaning they roll around in dusty or sandy bowl-shaped areas. Wallowing has two functions: (1) Coats the bison with dust or mud to keep insects away, and (2) Serves as a sign of aggression in bulls toward other bulls. Wallows and rubs are two types of bison sign. Also look for tracks (look like 2 fat bananas



facing each other), scat (also called buffalo chips), and well-worn trails called ruts where bison have traveled.

Most of the info in this section was paraphrased from Cherie Winner's children's book titled *Bison* from the Our World Series.

Suggested References for further reading:

Crewe, Sabrina. *The Buffalo*. Life Cycles series. Texas: Raintree Steck-Vaughn Publishers, 1998.

Geist, Valerius. *Buffalo Nation: History and Legend of the North American Bison*. Minnesota: Voyageur Press. 1996.

Hasselstrom, Linda. *Bison: Monarch of the Plains*. Portland: Graphic Arts Center Publishing Company, 1998.

Jones, Stephen R, and Cushman, Ruth C. *The North American Prairie (Peterson Field Guides)*. NewYork: Houghton Mifflin Company, 2004.

Lott, Dale F. *American Bison: A Natural History*. California: University of California Press, 2002.

Savage, Candace. *Prairie: A Natural History*. Vancouver: Greystone Books/Douglas and McIntyre Publishing Group, 2004.

Schult, Milo J. and Haugen, Arnold O. *Where Buffalo Roam*. South Dakota: Badlands Natural History Association, 1979.

Steelquist, Robert U. *Field Guide to the North American Bison: A natural history and viewing guide to the Great Plains buffalo*. Seattle: Sasquatch Books, 1998.

Winner, Cherie. *Bison*. Our World Series. Minnesota: NorthWord Press, 2001

## Program Activities

### Song

Objective: To introduce the theme, to engage students in the program, to "fill time" while latecomers arrive.

Write song lyrics on board or on tag board ahead of time.

#### "On the Prairie" sung to the tune of Frere Jacques

.On the prairie (response "on the prairie")

On the prairie (response "on the prairie")

Buffalo roam (response "buffalo roam")



**Munching grass here (response “munching grass here”)**

**Munching flowers there (response “munching flowers there”)**

**Buffalo roam (response “buffalo roam”)**

#### Materials

- Picture of a Bison

## Show and Tell

Objective: To use concrete items to engage students with the theme

Use a picture of a bison to illustrate bison adaptations. Be sure to hit on the following:

Large front end compared to back end – Huge muscles in front end help the bison carry and control its massive head, and enable it to run quickly for long distances

Horns – these are sharp and give both males and females a defense mechanism against predators. Horns are efficient for slashing at the side and belly areas of attackers. These types of wounds are often fatal to the attacker, as infection will quickly set into the open wounds. Bulls use their horns against other challenging bulls when mating season comes around. Most importantly, bison use their horns to break the crust on top of snow so they can get to the grass underneath the snow. The large head allows the bison to quickly clear an area of snow.

Hooves – Bison hooves are large and sharp. This gives bison sure footing in all types of prairie, as well as in winter conditions. These hooves churn up prairie soils as bison graze, helping plant seeds and keeping prairie soils from getting hard packed.

Hide and fur – Hide and fur are thicker on the front of the bison for several reasons. It helps protect bison from insects and ticks during the summer. In winter, bison walk face-first into winds and storms; it makes more sense for them to have more protection in front. Especially important for males, the heavy fur around the horns buffers blows from challengers during mating season. The fur at the back end is much shorter and a lot less shaggy. In summer, this allows the bison to cool more efficiently in the relentless prairie sun. The dark brown to black color of the fur makes it hotter for the bison in summer. However, this fur color may be one reason bison can survive harsh winters. The dark color will absorb heat, even on cold winter days.

Stomach – Bison are ruminants, meaning they have a stomach divided into



four compartments and chew a cud consisting of regurgitated, partially digested food. It sounds disgusting, but this chewing and re-chewing allows the bison to get as much nutrition as possible from the items they eat. The efficiency they get from the ruminant stomach means bison don't retain a lot of nitrogen in their bodies. It is taken out of the bison in the form of urine and scat, which return vital nutrients, including nitrogen, to the prairie plants and soils.

Tail – Bison use their tail as an important part of body language. A tail hanging casually means the bison is content and not agitated. It may sway side to side, much like a cattle's tail does and be used to swat biting insects. A bison tail that is held partly up or all the way up means the bison is excited and will tend toward aggression if it is further agitated. If you see a bison with its tail in any one of the raised positions, give the bison plenty of space and leave the area as soon as possible!

## Musk Ox Maneuvers from Project WILD (adapted to demonstrate bison herding behavior)

Objective: To evaluate the effectiveness of herding behavior in bison as a mechanism to protect individuals, and to further understand the purpose of specific animal behaviors

### Materials – Musk Ox Maneuvers Activity

- Flags
- Poker chips

Background Information for Activity: Bison are often found traveling in herds. Herd size varies greatly based on location, predators, and availability of food. Outside of the breeding season, the herd is composed of only cows (the females) and calves of both sexes. The bulls may travel in small herds of several individuals, or may venture alone. Bulls join the cow/calf herds only briefly during the mating season. They may stick around for a few days to a week to court a female and then guard her against other bulls. This behavior is sort of an insurance policy for the bull. This way it is more probable the calf will be his, effectively passing his genes to the next generation (the ultimate goal of reproduction in animals, and especially important for males).

When approached by a potential predator or threat, the bison cows will form a line or encircle the calves, facing the threat head-on. This behavior renders the calves and less-experienced bison relatively safe against natural predators, particularly wolves. It takes a pack of wolves to bring down a healthy, robust cow. That is, if the wolves can overcome the defense of the cows. The cows will use their horns to up-end the wolves or slash at their abdominal area. Abdominal injuries are nearly always fatal.



Procedure: NOTE - This activity is best done outdoors in an open area.

However, it is possible to do the activity indoors as long as there is enough space for students to freely move, including “tag-like” running.

- ❖ You will need to designate two wolves, and divide the rest of the group into equal numbers of cows and calves. If equal division is not possible, it is best to have one more cow than calf.
- ❖ Distribute the flags. Wolves should have one color and calves should have the other color. Each flag-bearer should wear the flag so it is hanging out of a back pocket or looped over a belt in the back. The flags need to be visible and easily removable.
- ❖ Tell the students the following information: Bison are herbivores (plant-eaters) and often graze peacefully in prairie meadows. While grazing, they spread out. Calves typically do not stray too far from their mothers, but the animals do not always stay clustered – except when predators appear. As the activity begins, the students representing bison are grazing peacefully and the wolves are out of sight of the herd.
- ❖ Show/tell students the following behaviors each animal should exhibit:
  - Cows:** As soon as grazing begins, the cows should choose a lead cow to watch for predators. The cows should pick a signal the lead cow will use to communicate to the rest of the herd that predators (wolves) are approaching. When the lead cow signals predators are near, all the cows move to form a circle around the calves. With calves in the center of the circle, the cows stand with their backs to the calves, facing outward to watch the wolves. The cows can move very little. Mostly, they stay firmly in one place, moving their upper bodies to block the wolves from reaching the calves. The cows cannot touch the wolves with their hands or feet. To kill a wolf, the cow must pull a wolf’s flag and wave it in the air. When a cow kills a wolf. The wolf moves off to the side, “dead” but able to watch the remainder of the activity.
  - Calves:** The calves depend totally upon the cows for protection. Each calf is to hold onto a cow with both hands at the cow’s shoulders, and follow only the cow’s lead. Calves cannot influence the cows’ movement.
  - Wolves:** Wolves begin the activity out of sight of the herd. They try to get as close as possible to the herd without being detected. Wolves typically work as a unit so they can attempt a strategy for surprising the herd in order to kill the calves for food. The wolves are mobile, able to move at any time in any direction. They can use any maneuver (except pushing and



shoving) to break the herd's defenses. Once a wolf kills a calf – by pulling the calf's flag out of its pocket – temporarily stop the game and move the calf's carcass to the side, where it can watch the remainder of the activity.

**A note about sound effects:** Wolves can howl to communicate predetermined signals and to startle and confuse the bison. The bison cows can grunt loudly.

- ❖ Poker chips should be spread about the playing area to simulate food. As the bison cows and calves go about grazing, they must pick up the chips. They must keep grazing until the lead cow gives the predator signal. Remember, time lost grazing is lost energy !!!
- ❖ The wolves go away and the simulation begins. All animals should behave as detailed above.
- ❖ The activity can conclude in several ways:
  - All the wolves could be killed
  - All the calves could be killed
  - The wolves could give up in frustration after a period of time with no success in killing a calf.
  - The wolves could kill one or more calves, and the activity would conclude because you know the wolves are going to eat the calf (or calves) and the herd will move on.
- ❖ After each round, discuss the strategies wolves and cows used to accomplish their goals. What works best and gives the highest rate of success?
- ❖ Try several rounds and give students the opportunity to play different roles. Don't change the rules, just the roles. Don't forget to redistribute the flags and put out the poker chips.



## Craft/Hike

### Materials - Craft

- Newspapers
- Brown paper bags
- Scissors
- Picture of pictographs
- Crayons

**Objective:** To learn something about the theme by doing a hands-on activity, and enjoy a craft. The hike objective is to get students outside to learn about our natural world, including learning where bison live and what they eat.

### Craft: Winter Count

Discuss with students the fact that the Plains Indians depended on the buffalo (bison) for their existence. The buffalo provided clothing, food, robes, blankets, tools, rugs, fuel, and eating utensils. The Plains Indians respected the buffalo and always gave thanks for the buffalo's assistance in their way of life. Oftentimes, stories would be recorded on buffalo skins. These stories were written in symbols known as pictographs. Distribute to students examples of pictographs. Explain to them that they will use these pictographs, or ones they make up themselves, to tell their own stories.

### Directions for Creating the Buffalo Hides:

- ❖ Cut along one seam of the paper bag to open the bag into a large piece of paper.
- ❖ Using scissors or tearing (tearing looks more authentic), cut out a hide shape from the paper.
- ❖ Using crayons and the pictograph samples (plus any they make up for themselves), write one significant event from each year you've been alive on the bag. Be sure to press very hard on the bag with the crayons.
- ❖ Lightly crumple the paper buffalo hide. This gives it a more realistic and rustic look.
- ❖ Have students share their life story with the class.

**Hike:** Take children on the trail with tall grasses. Be sure to point out the tall grasses in the prairie. This is typical bison habitat! The prairie has everything the bison need to survive, but they do need to seek water elsewhere, as prairies are relatively dry at the surface. They look to ponds, lakes, rivers, and streams for water sources. On the hike ask students to pretend they are bison, what would they need to survive?

