

Bison Bellow Instrument

Learning Objectives:

- Learn about the bison's social nature.
- Learn about bison anatomy.

Prep Time: 15 minutes

Duration: 15-30 minutes

Learning content:

The largest terrestrial animals in North America, bison are characterized by a hump over the front shoulders and slimmer hindquarters. Both male and female bison have a single set of short, sharply pointed, hollow horns that curve outward and up from the sides of the massive head. The head, neck, forelegs, and front parts of the body have a thick coat of long, dark hair. The adult bull adds to this thick coat with a black beard about one foot long. The rear part of the body is covered with much shorter hair. The shaggy head is the most heavily insulated part of their body, which has adapted as such to withstand blizzards as the animal stands facing into the wind. Heavy coats are shed in the spring as the animals roll to loosen the hair, which falls off in gobs.

A mature bull can reach 5.5 to 6.5 feet (1.9 meters) high at the hump and nine to 12.5 feet (2.7 to 3.8 meters) in length. Females are normally smaller, at 7 to 10 feet in length (2.2 to 3.2 meters) and 5 feet high at the hump (1.5 meters). Bison can weigh 1,800 to 2,400 pounds (816 to 1,088 kilograms).

At one time, bison were widespread from Alaska to northern Mexico, but the current range occupied by conservation herds has diminished to one percent of its original status due to colonial invasion and conflict against Indigenous people. Today, herds can be found in parts of Alberta, British Columbia, Manitoba, Northwest Territories, Ontario and Saskatchewan in Canada, as well as Arizona, California, Idaho, Montana, South Dakota, Utah, Alaska and possibly Texas in the United States. Modern conservation herds are substantially fragmented. Originally, bison were found primarily in the grasslands and prairie of North America. Today, bison distribution is greatly limited due to population decline and their movements are greatly regulated. Within the national parks, bison are found at all elevations.

Bison are year-round grazers. They feed primarily on grasses, but will also consume flowering plants, lichens and woody plant leaves depending upon availability. To find grass in winter they sweep their heads from side to side to clear the snow. On the average, bison ingest 1.6 percent of their body mass per day of dry vegetation. Bison require water every day as well.

Bison are usually found in bands arranged by sex, age, season, and habitat. Older bulls are often solitary. Both cows and bulls live in a dominance hierarchy, which is established early in life. Most of the year, females with young form small bands, and immature bulls may stay with them. The bands may congregate in large herds in the spring or fall to search for food or water. Mature males have their own groups that may reach up to 30 individuals. Grazing takes place during several periods each day and is conducted in loose groups. When bison travel, they form a line. Bison are also adept swimmers, able to cross streams and rivers without difficulty. The life expectancy of

American bison is 15 to 20 years. Adult bison are relatively safe from natural predators; however, weak, old or young bison may fall prey to mountain lions, bears or wolves. Bison communicate through grunts to maintain contact with each other and will snort to warn intruders. Male bison display their fitness by charging and butting heads with other bulls. They also bellow hoarsely, lower their heads, and paw the earth defiantly, but they rarely fight to the death. Bulls may bellow when threatening each other. This sound has been compared to a lion's roar and can be heard up to 5 km (3 mi) away. (Meagher 1986) (Buchholtz & Sambraus 1990). They have an excellent sense of hearing and smell, but cannot see very well, so an entire herd can stampede if it is startled. Bison have cloven hoofs and can reach speeds of 30 miles per hour. (Smithsonian's National Zoo & Conservation Biology Institute)

Supplies:

- Paper cups (one per group/ student)
- Corrugated material, metal works best (one piece per group/ student)
- Various other household materials, such as funnels, bowls, string, coat hangers, etc.
- Online recordings of bison sounds
- Images and videos of bison

Set Up:

- Have bison images and videos ready for discussion.
- Remaining assorted materials will be used to create an instrument and should be divided for students to use independently or in groups.
- Prepare a recording of bison sounds to share with students. The National Park Service website has a page with different bison sounds, "The Bison Bellow".
- Provide bison horns, toes, and felted animals for students to touch and explore.

Optional additions:

- Felted bison
- Bison anatomy images
- Bison horn
- Bison toe

Activity:

1. **Introduce** the activity. What do bison look like? What do they sound like?
2. **Disseminate** bison materials, such as the horns, toes, and felted animals, for students to handle and discuss their observations.
3. **Show bison images and videos** and discuss behavior. Why do bison live in groups? Why do bison have horns? Why do bison have long and short hair?
4. **Play a recording** of the sounds for the group. Why do bison make sounds?
5. Show students different assorted materials, such as funnels, cardboard, string, and bowls. Invite them to **engineer** an instrument that recreates the bison sound using the materials. Note: one way to recreate the sound is by dragging

the edge of a paper cup against corrugated metal - use speed to change the pitch of the sound.

6. Invite students to play their instruments together to **imitate a herd** of bison.

7. **Reflect.**

Extension:

- Explore the science of sound: sound travels in compression waves differently through different material, such as the gas making the air around us, water, or string. Using two cups connected by a taut string creates a “telephone affect” where one student speaks into the cup while the other listens through their cup on the other side of the string.
- Invite students to find ways to create other animal sounds.
- Invite students to explore the different sounds they can make using the bison materials.

spectrUM Pedagogy:

Inspire Curiosity: Ask open-ended questions and encourage creative thinking.

Encourage Growth Mindset: Building can be challenging and a point of frustration for some students. Be available to help students when invited, do not build their instruments for them. Encourage students and praise them on their effort and problem-solving skills.

Make Meaning: Create personal connections between science and students by asking them about their relationship with bison and other animals.

Navigate Your Future: Let students know about resources and opportunities for them to continue to pursue an interest in wildlife, such as classes, clubs, camps, and higher education.

Collaborate With Communities: spectrUM has collaborated with many tribal representatives to connect science with Indigenous traditions. These resources can be found on spectrUM’s website, umt.edu/spectrUM.

Try It: Encourage student autonomy by providing them the opportunity to build their instruments and problem-solve independently.