



Understanding Animal Adaptations

Adapted from LA Dept. of Wildlife and Fisheries

Focus/Overview

Students will explore the ways humans and beavers have developed body structures that adapt to their habitats. They will then use props to represent these adaptive beaver features, turning a volunteer student into a beaver.

Learning Objective

The learner will...

- describe the features of a beaver that benefit them in their environment.

Louisiana Grade Level Expectation

1: GLE-32	Describe features of some animals that benefit them in their environments (LS-E-C1).
-----------	--

Materials List

Provide a list of supplies necessary to conduct the activity.

- Knee Deep in Louisiana Wetlands** CD (see resource list)
- computer
- paddle
- teeth (cut from an index card or a picture of teeth)
- piece of real or fake fur, hide, or brown towel
- swim fins
- oil can
- gloves
- ear plugs
- nose plugs
- goggles
- musk cologne or perfume

Background Information

The beaver is the largest North American rodent and lives in every state and province in the United States and Canada. Its biological name is *Castor canadensis*. American Indians called the beaver the “sacred center” of the land because its ability to change the landscape by damming streams and small rivers enables other wetland mammals, fish, frogs, turtles, ducks and birds to thrive in the newly created wetland habitat.

Beavers live in lodges that they build in rivers and streams from small trees and mud. First the beaver gnaws down trees that fall into the river forming a dam, which floods the upstream portion of the river. Beavers build their home, or lodge, on the top of the dam, with the opening to the home underwater, which helps keep them safe from predators. Beavers are great swimmers and can hold their breath for as long as 12-15 minutes and can swim underwater up to a mile.

Beavers are often confused with another large rodent that is not native to Louisiana, the nutria. Unlike the nutria, beavers have a wide flat tail, which measures 11-15 inches long and 6 inches wide. They use their big tails to propel them through the water when swimming and to warn other beavers of danger by slapping it on the water to raise an alarm. Adults are humped backed and weigh an average of 33 pounds.

BTNEP Connection

Changes in Living Resources

Grade Level

1

Duration

30 minutes

Subject Area

science

Setting

classroom

Extension Areas

math, language arts

Vocabulary

habitat, function, adaptation

Original Source

Modified from LA Dept. of Wildlife and Fisheries
“Dress a Fish.”



www.btnep.org

Beavers have several features besides their tails that help them live in an aquatic habitat. They have webbed feet and special castor glands on their abdomen that produce oil that the beaver rubs onto its fur to waterproof it. Also their ears and nose have special muscles that allow them to close these openings when underwater.



LA Fur and Alligator Advisory Council

Beavers mate for life during their third year. Both parents care for the baby beavers, called 'kits', which are usually born in the spring. There can be anywhere from one to four kits in a litter. The kits normally stay with their parents for two years, and yearlings act as babysitters for the new litter.

Beavers can live for as long as 19 years and can get as long as 3 to 4 feet. During their lifetime, beavers are strict vegetarians,

eating on the outer layers of many woody trees, such as sweetgum, yellow poplar, and willow.

In Louisiana, beavers are trapped for their fur, which is part of a fur industry that produces more than 1.3 million pelts a year from nutria, muskrat, mink, otter and beaver.

Advance Preparation

1. Assemble pictures of animals (including humans and beavers) and plants that have adapted to their habitat. Include video clips, animated clips from CD's (see Knee Deep in Louisiana Wetlands CD).
2. Assemble prop materials. See **Blackline Master #1** for a list of prop items and the part of beaver each represents, and functions.

Procedure

1. Show students pictures of humans involved in daily activities.
2. Lead a discussion of structures on humans which help or protect them while they perform these activities. Examples include (1) writing – fingers and thumbs; (2) playing in the sun – hair; and (3) chewing food – teeth.
3. Show pictures of animals and where they live, including beavers. Show any animated clips or videos available. What kinds of things do beavers do during the day? (*Swim, eat, sleep, dive and swim underwater, etc.*) Prompt a discussion of the features (body structures) that beavers have that make these types of behavior possible. Do beavers have any special body parts that help them do these activities? What are they?
6. Explain that this is called **adaptation**. Discuss with the students the definition of an adaptation and how it is useful to a plant or animal. Explain to the students that an organism may have many different adaptations and that this activity is designed to show them the varying adaptations of an aquatic mammal - the beaver.
7. Ask for a student volunteer from the group and tell them that, with the group's help, you are going to turn the student into a beaver by dressing the volunteer with props representing all the adaptations that a beaver possesses. Who give me an adaptation that the beaver has that enables it to survive its aquatic environment? (See **Blackline Master #1** for guidance). As the students come up with the different adaptations, add the appropriate props, one at a time, to the student. Make sure to take time to explain the uses of each adaptation to the group and how it helps the beaver survive. The props can be put on the volunteer in any order and leading questions can be asked to help the group come up with all of the adaptations.

Blackline Master

1. **Animal Adaptations**

Assessment

- Put the Dress a Beaver props in a large pillowcase or bag and have students draw a prop out at random and tell what adaptation it refers to on the beaver.

Extensions

Mathematics/Language Arts:

Read **Twelve Snails and One Lizard** (see Resource List below) and have students find other nontraditional tools they could use to measure 36 inches.

Resources

Tradebooks:

George, Lindsey Barrett. 2000. **Beaver at Long Pond**. Simon and Schuster.

A beautifully illustrated book about a beaver's nighttime work. Reading level: Ages Baby - K.

Hightower, Susan. 1997. **Twelve Snails and One Lizard**. Simon and Schuster.

A math lesson (inches, feet, and yards) in story form.. This story is about Milo the Beaver who needs to cut a branch exactly 36 inches long to bridge a gap in his dam before the pond goes dry. Reading level: Ages 4-8.

McDonald, Amy. 1998. **Little Beaver and the Echo**. Puffin.

A beautifully illustrated book with detailed and colorful pictures. This story is about a young beaver who is searching for someone across the lake, that ends up being his echo. On the way he meets a variety of friends: a duck, an otter, and a turtle. Reading level: Ages 4-8.

Websites:

Beavers: Wetlands & Wildlife. 2002. **The Beaver (*Castor canadensis*)** accessed on June 2, 2004, from <http://www.beaversww.org/beaver.html>.

References

Gateway New Orleans. 2002. **Facts About Louisiana**, accessed 06/03/04 at <http://gatewayno.com/history/Facts.html>.

Louisiana Fur and Alligator Advisory Council, n.d., **Beaver: *Castor canadensis***. Accessed on June 3, 2004, from <http://www.alligatorfur.com/biology/beaver.htm>.

Animal Adaptations



Item	Represents this beaver part	Functions
canoe paddle (handle may need to be cut off)	tail	<ul style="list-style-type: none"> The tail helps the beaver maneuver while swimming (propeller to push it through the water and rudder to steer). Beavers warn other beavers of possible danger by slapping it on the surface of the water. Beavers store fat in their tails for times when the food supply isn't abundant. Beavers use their tails as a stool (for support) when sitting up to gnaw on trees.
teeth cut from an index card.	teeth	<ul style="list-style-type: none"> The beaver's teeth help the beaver obtain the wood materials that they need to eat (cambium trees) and build their lodges and dams. The teeth of a beaver are unique. They grow at an enormous rate (as much as three inches a month). Beaver's front teeth grow continuously, keeping pace with the constant wear from gnawing wood. The teeth stick out past beaver's lips so it can gnaw, chew, and swallow underwater without choking.
deer hide, fur, or brown towel	fur	<ul style="list-style-type: none"> The fur of a beaver helps keep the animal warm. Inner fur, or undercoat, is thick, soft, and fuzzy and used to trap air to keep the body warm. The outer fur consists of tough guard hairs used to shed water - much like a raincoat. The beaver has a built-in radiator, a special kind of circulation that brings heat to their legs and feet, which are often wet and exposed to the cold. The brown coloration of beaver fur provides protective camouflage when out of water. The beaver was once an endangered species in Western North America due to extensive trapping for the sale of furs.
oil can (quart of oil)	oil gland	<ul style="list-style-type: none"> The oil from the oil gland helps to keep the beaver dry even when swimming.
swimming fins or flippers	back feet	<ul style="list-style-type: none"> Webbed hind feet of the beaver enhance the swimming ability of this mammal by providing propulsion through the water. The second nail on each foot has a split nail that is used for grooming.
gloves	front paws	<ul style="list-style-type: none"> The front paws of the beaver are able to grasp materials much like human thumbs. The beaver's front paws are used for digging, working on dams and building their lodges, as well as gripping their food.
ear plugs	special muscles in the beaver's ear canals	<ul style="list-style-type: none"> Special muscles in the beaver's ears enable them to close their ear openings completely so no water to enter ears when under water. Beavers can stay under water up to fifteen minutes.
nose plugs	special muscles in the beaver's nose	<ul style="list-style-type: none"> Special muscles in the beaver's nose enable them to close their nose openings completely so that no water is able to enter while they are submerged. Beavers can stay under water up to fifteen minutes.
swimming goggles	clear third eyelid	<ul style="list-style-type: none"> Beavers have a clear third eyelid, 'nictitating membrane', which covers and protects their eyes.
musk cologne or perfume	musk oil (caster gland)	<ul style="list-style-type: none"> Beavers have a special oil gland that they use to mark their territory. Beaver musk oil has been used to make some perfumes and medicines.