



Eco Beaver

Objective: Students will learn about the beaver's adaptations to the environment by becoming a beaver.

Materials:

Beaver costume materials
Adaptation list

Background:

The beaver is North America's largest rodent. This mammal is warm-blooded, has fur, gives live birth, and feeds its young. The beaver is mostly nocturnal but may be active at dawn and dusk. It is a semi-aquatic mammal, spending time both on land and in water. They are herbivores and prefer to eat leaves, bark, twigs, roots, and aquatic plants. The beaver will stay close to shore to avoid predators. They cut down the most trees in September and October to prepare a food pile or cache for the winter.

Physically, the beaver is easy to recognize with its flat, scaly tail, brown fur, and stout body. They have orange teeth which never stop growing. The beavers constant gnawing on wood keeps their teeth from growing too long. Socially, the beaver avoids confrontation. If a beaver approaches another, one will walk away. Beavers in one area don't fight over territory or food. Many beavers live to be 12 years old.

It is estimated that over 60 million beavers lived here before the discovery of the New World. Many North American Indian tribes considered the beavers sacred and killed only those they needed to survive. During the 1600's, the demand for beaver pelts by the European settlers depleted the beaver population. By 1750, an estimated two million beavers had been killed in North America. By 1820, beavers were totally exterminated in the area that is now New Jersey.

Aside from humans, no other animal has the capacity to modify its environment as much as the beaver and are known as "Mother Nature's Engineers". They are also a "keystone" species because they create wetlands that provide valuable habitats for other animals. Beaver ponds especially benefit waterfowl during breeding, migration, and over-wintering.

Procedure:

- Ask the students for a volunteer to help teach everyone about a remarkable animal, the beaver.
- Starting with the first item on the costume list, put each item on the student. Ask the class what beaver adaptation the item symbolizes.
- At the end of the costume list, you should have the student dressed as a beaver. Discuss with the class the significance of the combined list of adaptations. All of these things are necessary to the beaver's survival, and together they make the beaver a wetland animal.

Grade Level:
3-8

Subject Areas:
Science, Reading, Visual Arts

Setting:
Classroom and outside at a wetland

Skills:
Communication, role-playing

Prior Preparation:
Read *Busy Beavers* or have students complete "Eager Beaver Engineers" from the *Leapfrogging Through Wetlands* (pg. 14) to familiarize them with the method that beavers have used to adjust to their environment.

Vocabulary:
castor gland, nictitating membrane

South Dakota Education Standards for 4th grade:

Reading

4.R.1.1; 4.R.1.2

Science

Nature of Science, Indicator 2; 4.L.2.1

Visual Arts

Standard 1

Vocabulary Glossary:

castor gland: The gland that is located at the base of the beaver's tail. Castorium from the gland is used to scent mounds to mark territory or attract mates.

nictitating membrane: The third eyelid that covers the eye while a beaver is underwater.

Extensions:

Have students research the four laws of ecology:

1. Everything is connected to everything else
2. Everything must go somewhere
3. Nature knows best
4. There is no such thing as a free lunch

After researching, divide the students into four teams and assign each team one of the four laws. Allow 10 minutes for each team to brainstorm about whether a beaver is acting under its assigned law. The students should record specific signs and information for a group discussion. Have a spokesperson from each group review their findings with the class. Is the beaver obeying this law? If people disobey a law they are fined or imprisoned. What is the beaver's punishment?

Beaver Adaptations Chart

OBJECT	ADAPTATION	FUNCTION
Ping-Pong Paddle	Flat tail	Rudder, to store fat in the winter, to support itself during tree cutting and to slap the water as a warning.
Combs	Hind toenails	Grooms fur and spreads oil
Fins (children's swimming)	Webbed feet	Swimming propulsion, grooming and walking
Spray bottle	Castor gland	Scent mounds to mark territory or to attract mates
Paper teeth	Teeth	Cutting down trees and eating
Goggles (or safety glasses)	Nictitating membrane (clear third eyelid)	Covers the eye while under water
Ear muffs	Ear flap	Keeps water out of ears
Clothespin	Nose flap	Closes the nose to keep water out
Foam circle	Fat layer	Provides warmth and protection
Beaver pelt	Fur	Water proofing and insulation

