



Just Dam It

This activity center is part of the **Water Protection** theme.

What's the purpose of this activity?

Students will come to understand the importance of all the elements used by beavers when building a dam (sticks, mud and water) and will learn about the benefits of the flooded area, which is produced. Students will also investigate factors that alter various habitats and will learn that living things (including humans) rely on other living things.

Key messages:

- Beavers are industrious creatures and are well adapted for their role as a keystone species.
- Although the construction of a beaver dam and the resulting flooding may seem destructive, it creates habitat not only for the beaver but also for many other species.
- Beavers play an important role in the dynamics of the forest ecosystem.

Materials:

- Two beaver dam activity models with water attachments
 - Two hoses coming off of "Y" coupler and feeding the rivers at the top of the two beaver dam activity models
 - Water barrel filled with clean water
- Two Water collection containers
 - Place at bottom of the beaver dam activity model, water will drain into container

- This is where the debris will go after hosing down/cleaning up the model after the activity is complete
- Sticks and mud can be collected and muddy water disposed of

- Two containers of varying sized sticks (ranging from 2 inches to 4 inches).
- Two containers of mud
- Backdrop of Beaver Pond (if available)

Activity Set Up:

1. Set models up on tables. Spacers may be placed under the models to increase slope and the effect of gravity.
2. Set up a small barrel at the end of the table for water to drain into.
3. If using pump, place a small inflow/outflow water pump on a plywood platform on top of the collection container. A hose from the inflow of the pump will collect water from the container. A hose from the outflow of the pump will travel up to the top of the activity table and will feed the river(s).
4. If using a hose from a water faucet, secure the hose ends to the top of each activity model.

What will I be doing?

At the beginning of the day you will ensure that the set-up has been completed and that you have all of the materials necessary to run the station. For each rotation you will be monitoring the students' success in filling the basin surrounding the river, the beaver pond. The goal is to get the students to stop water from passing through the stream and fill the basin until the water reaches the golden trees! After the group has

accomplished their task of creating a beaver pond initiate a discussion, using props, on some of the adaptations of beavers to their industrious aquatic lifestyle.

1. Explain to the Students that the objective of the activity is to build a dam which will stop the flowing water of the river and fill the basin up to the “golden trees” which will create a beaver pond.
2. Explain that it is important to fill the basin up to the “golden trees” because Beavers depend on trees for food and for building their dams/lodges. Beavers are safer when they are in the water (their main predator, the wolf, cannot reach them), consequently, they want to fill the basin up to the “golden trees” so that they can access the trees without getting out of the water.
3. Divide students into two groups. Explain that they need to build their dam in the lower narrow of the river (downstream from the basin) and what they need to build their dams is all in front of them in the buckets (sticks and mud). Emphasize to the students that they cannot pierce the model (the Styrofoam) with their sticks to make them stay (as this will destroy the activity).
4. Start the water running and have the students build their dam. Make sure that the water running from the hose is flowing at a somewhat slow pace.
5. The students who get their basin to fill and reach the “golden trees” have accomplished the goal -They’ve made a beaver pond!
6. Initiate a discussion, using the 5 questions and answers provided below.
7. If time, ask students, “What other animals benefit from beaver ponds?”
8. Wash away mud and sticks from beaver dam activity model into collection bucket. Sticks and mud can be collected out of this for other groups and the dirty water can be distributed elsewhere.

Questions to ask Students:

Q: Why do beavers cut down trees?

A: Beavers live on the bark of trees, their favourite trees are aspen. But they will also feed on birch, cottonwood, willow, and alder. Trees may be cut down

and immediately eaten, but they may also store branches and stems underwater for a winter food supply.

Conifer trees are an example of trees that are mainly cut down for building materials, for both their dams and lodges. As the front cutting teeth of the beaver never stop growing, beavers need to cut down trees to manage the growth of these teeth while keeping them sharp.

Q: Why do beavers build dams?

A: Beavers dam up slow moving streams in order to control their aquatic environments. The beaver controls the level of the water to ensure that their lodges are neither flooded nor left dry. The flooded area serves as a protective moat from the beaver’s predators, such as wolves, bears and sometimes coyotes. The flooded area also provides the beaver with the deep water needed for winter food storage.

Q: How does a beaver change their habitat?

A: Beavers are known for their ability to change their surrounding environment in order to meet their needs for survival. When beaver dams a stream or a small river they alter the surrounding area by flooding the area creating a wetland. This in most cases changes the surrounding area from a terrestrial ecosystem to an aquatic ecosystem.

Q: What types of animals would benefit from the presence of a beaver?

A: Within an active beaver pond animal species such as; waterfowl, amphibians, reptiles, bats, wetland bird species and furbearers (otters, raccoons) benefit from the provided habitat.

Q: What is a keystone species? Would you consider a Beaver to be a keystone species?

A: A keystone species is a species that affect many other organisms within an ecosystem or habitat. Such species affect many other organisms in an ecosystem and help to determine the types and numbers of various others species in a community.

Additional Background Information:

Beaver Lodge Facts

- Domed lodge
- Made from branches and mud

- ~2m (6.6ft) high
- ~4-8m (13.3-14.6ft) wide above waterline
- Lodges have one or two underwater entrances, no access from above water
- Built at the centre of ponds or at the side of already existing lakes, occasionally in bank burrow
- Offers protection from most predators (exception: otter)
- Average number of beavers per lodge = 5-9
- Average number of lodges per km² (0.4 sq. mi) in Algonquin Park = 0.4-1
- Young beavers leave home usually at age 1, some stay for 2 years

Beaver Dam Facts

- Dams can reach up to 3m (10ft) in height and 500m (1640 ft) in length
- Average dams in the Algonquin area reach up to 0.96-1.2m (3-4ft) in height and 15-30m (50-100ft) in length
- Biggest beaver dam recorded was in Saskatchewan = 1500m (5000ft) long, 3m (10ft) high
- Longest measure beaver canal recorded was in Colorado = 230m (750ft)
- Dams are built to create and control their aquatic environment
 - Ensures access to food sources
 - Ensures that lodges are neither flooded or left high and dry
- A pair of beaver can build a solid dam in 3 to 4 days

Beaver Pond Facts

- Average area covered by a beaver pond = 4ha (10 acres)
- Ponds created are deep enough that they do not freeze to bottom
- Common beaver pond inhabitants or visitors
 - Muskrat
 - Mink
 - Otter
 - Moose
 - Great Blue Heron (dead standing trees → nesting)
 - Mallard, Black and Wood Ducks (dead standing trees, emergent vegetation → nesting)
 - Hooded Mergansers (dead standing trees → nesting)
 - Three-toed Woodpeckers (dead standing trees → nesting)

- Migrant Geese
- Tree Swallows
- Harriers
- Frogs
- Turtles
- Snakes
- Fish/Minnows
- When the dam breaks after abandonment, a grassy meadow develops ... a beaver meadow
 - Common beaver meadow inhabitants
 - Swamp sparrows and other field songbirds
 - Meadow mice
 - Fox
 - Upland nesting ducks
 - August & September → wolves, pups play and rest while the adults are off hunting (rendezvous site)
- In this meadow, early succession tree species such as poplar and birch seed and begin to grow starting the natural reforestation process
 - These tree species provide shade for shade tolerant species of trees such as maple and beech
 - Then the meadow once again becomes a forest ... beaver landscape ecology

Clean Up Procedures:

At the end of the day make sure all items for the presentation are cleaned up and ensure that the mud and sticks are separated and ready for the next day. Leave the site as you found it for the next day's volunteers.

