

Place-Based Education at Our Table Cooperative Farm
Spring 2020: Beavers: All Organisms have external parts

First Grade: From Molecules to Organisms: Structures and Processes 1-LS1

Structure and Function: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)

Other than humans, beavers are the only animal known to construct dams. Known as the engineers of the animal world, the beavers' anatomy is specifically designed to gnaw down trees, to transport logs and branches, and to create an interwoven and durable structure that can serve as a home (lodge) and a dam that can reshape waterways.

Beavers are rodents. The word *rodent* means "THE BEAST THAT GNAWS." All rodents (except one) have two upper front teeth and two lower front teeth called *incisors* that continue to grow throughout the animal's life. They use these teeth to slice and grind through things like a pair of scissors. All rodents (except one) also have grinding *molars* in the back. The beaver uses their teeth to gnaw on tree trunks to fell trees.

In order for this mammal to live a semi-aquatic life, beavers utilize a host of adaptations that help them navigate the water. Beavers have powerful front claws and webbed back feet that help them transport branches and easily swim through the waterways. *Nose and ear valves* shut to keep out water while submerged, and *nictitating membranes* or transparent "third eyelids" act as goggles. Perhaps most useful is that their lips close behind their oversized front teeth, allowing the beaver to transport building materials and food without drowning. They use their wide rudder-shaped tails for swimming as well as for slapping against the water to communicate with other beavers that there could be danger nearby.

Beavers have what is called *underfur*, short, thick, gray and fuzzy hairs found underneath the long, silky *guard hairs*. Each hair of the *underfur* is covered in dozens of tiny barbs like fishhooks. Beaver fur has up to 100,000 hairs per square inch. Beavers also have a special gland that produces oil. They come out of the water to groom themselves and spread the oil over their fur. This oil makes them waterproof, keeping them warm and dry in the water. Felted beaver fur is the toughest and strongest felt in the world and is why they were almost hunted to extinction.