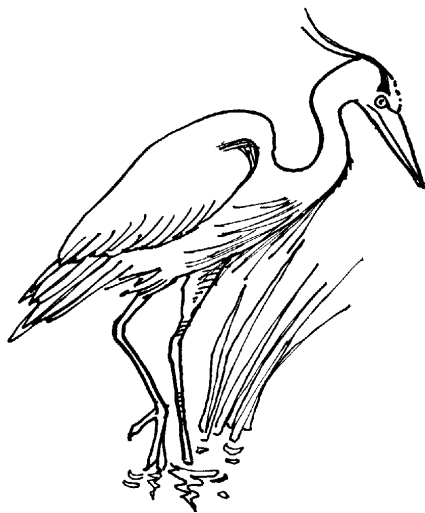
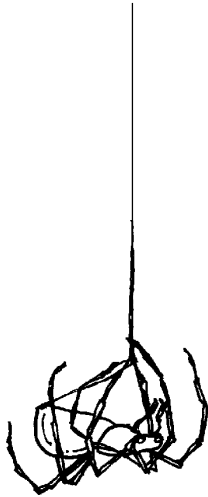


## Lesson four

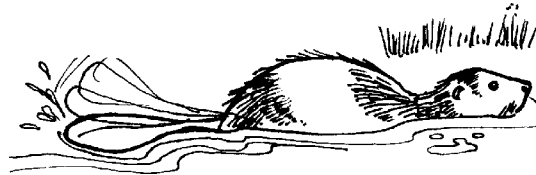
# Adaptations

### SPIDERS

Spiders have developed the ability to spin silk. This allows them to build elaborate **webs** that trap food while protecting them from other predators.



All animals have **adapted** physically and behaviourally to allow them to use their environment and to help them find a **niche** within an ecosystem. Let's examine some common wetland organisms and some of the adaptations they've made.

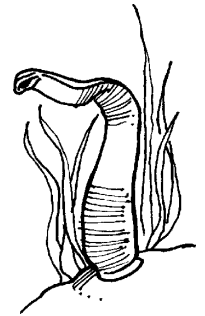


### BEAVERS AND MUSKRATS

Both of these **mammals** have **weblike** feet which make them strong swimmers. Their **tails** are different, however. Although a muskrat's tail is long and thin and a beaver's tail is broad and flat, both act as rudders for steering. The beaver slaps its tail on the water to warn other beavers of approaching danger. Beavers have long, sharp front **teeth** to help them cut vegetation for food and building material. The beaver also has **clear eyelids** to provide protection while swimming underwater. Special **oil glands** and **thick fur** keep these animals warm and dry. Why do you think these animals were important in Canada's history?

### LEECHES

These **wormlike** creatures have **suckers** on either end that help them cling to plants so they are not swept away by wind or waves. The suckers allow them to hang on to larger, stronger prey while they are taking their blood meal. Leeches swim by moving their long bodies in undulations.



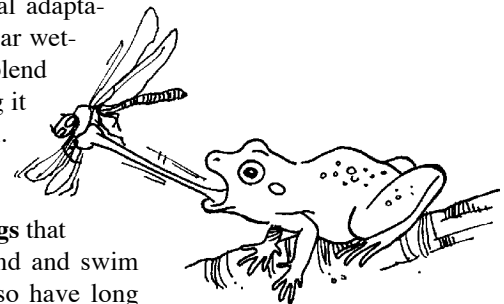
### HERON

These and many other **wetland birds** have **long legs** that make it easy for them to wade in water in their search for food. They also have long **bills** for catching fish, frogs and other food. They **nest** in colonies high up in trees and **migrate** south in the winter to find open water.

### FROGS AND TOADS

These **amphibians** have several adaptations to assist them in living near wetlands. Their **colours** help them blend in to their surroundings, making it difficult for predators to see them.

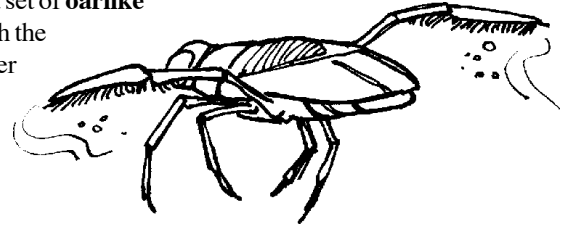
Many toads also produce a **poison** that makes them taste bad to predators. Frogs have **long legs** that help them jump quickly on land and swim strongly in the water. They also have long **sticky tongues** that allow them to catch insects for food.



## Lesson four continued

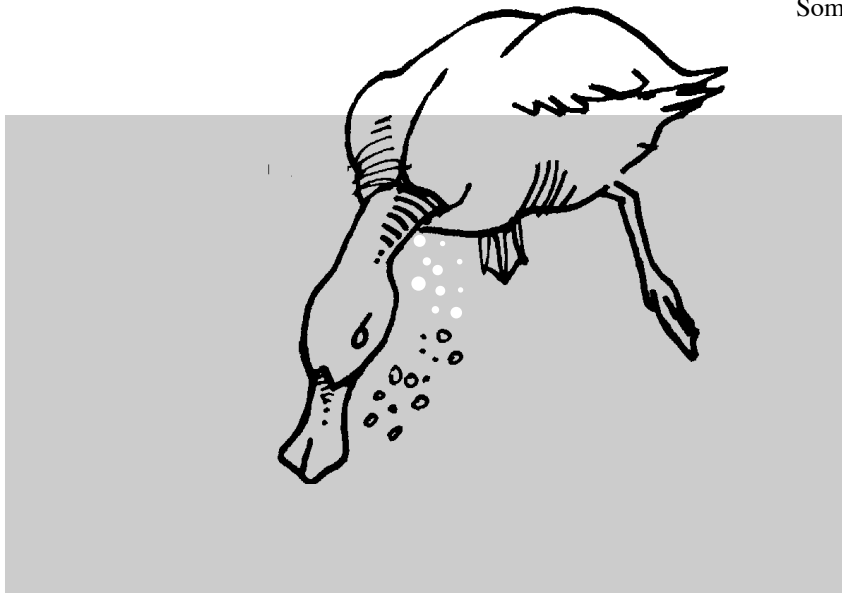
### WATER BOATMAN

These marsh **insects** have a set of **oarlike legs** that move them through the water much faster than other insects. This helps them catch their prey while escaping animals who would like to eat them.










### DUCKS

Different species of ducks have different adaptations to help them survive in the wetland. The females are very **drab coloured** so that predators find it difficult to locate them on the nest. All have **webbed feet** to make them better swimmers.



Some ducks, like **wigeons**, have bills that allow them to graze on grass, while **mergansers** have sharp, teethlike **lamellae** to help them catch fish. **Shovelers** use their lamellae to strain for small invertebrates. **Wood ducks** and other species nest up in trees in old woodpecker holes and natural cavities. This provides them safety from predators like foxes, skunks and raccoons. People and conservation groups like Ducks Unlimited put up wooden nest boxes to help these and other cavity nesters find homes.

Some ducks, like the **blue-winged teal**, nest in grassy fields while others like the **canvasback** build floating nests out of cattail. Other ducks, such as the **mallard**, use their webbed feet to tip up and dabble at the water surface for food. **Redheads** have their legs farther back on their body and can dive to the bottom of the wetland to feed.

<i>Plant/Animal</i>		<i>Adaptation</i>
Cattail		Have air cells in stalk. Two ways to reproduce: 1) male and female flowers are on the same stalk and seeds are blown by wind or 2) spread by rootstalk like a lawn.
Bladderwort		Submerged leaves have tiny sacs with sensitive bristles to detect tiny aquatic animals that it eats and are filled with air to float in the water.
Water Lilies		Upper leaf has tiny openings to take in gas. Young leaves take in oxygen for the roots and older leaves give off carbon dioxide. This is efficient for roots buried in the low-oxygen muck. Large floating leaf collects sunlight for photosynthesis.
Pondweeds		Air spaces allow the stems to float and thus absorb carbon dioxide and release oxygen.
Sundew Plant		Leaves are reddish due to a fringe of hairs that release a sticky fluid to trap small insects. A carnivorous (meat-eating) plant grows in nutrient-poor bogs.
Pitcher Plant		Tubular leaves collect rainwater and a striking reddish lip to attract insects inside. Insects provide nutrients that are not available in the nutrient-poor bog where this carnivorous plant grows.
Peat moss		Ability to hold 200 times its weight in water so it can live in waterlogged conditions.

**Plant/Animal****Adaptation**

Mosquito



Mosquito larvae can hang upside down from the surface of water to breathe and to trap food with the bristles around their mouths.

Caddisfly Larvae



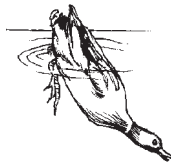
This larvae glues together pieces of plants and small pebbles to form a case. The cases camouflage them on the bottom of ponds and protects them from predators.

Frogs



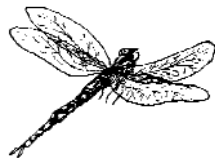
Green, yellow or brown skin with dark blotches and lines act as camouflage. Their moist, thin skin absorbs oxygen and water. Bellies are white to blend with light above water, and camouflage it from predators below.

Ducks



Oily, waterproof feathers prevent skin from getting wet and cold; webbed feet for paddling through the water. (See poster for *Bottoms Up!*)

Dragonfly



Possesses two sets of wings that can move independently. This allows the insects to hover and fly forward and backward quickly enough to catch mosquitoes.

Muskrat



Dark, brown coat is waterproof. Slightly webbed hind feet help them to swim. Long skinny tail acts as a rudder.

Beaver



Thick undercoat for warmth and long outer guard hairs coated with oil for waterproofing. Webbed hind feet for swimming. Tail acts as a rudder, is used to warn other beavers (slapped on the water surface) and helps them sit up. Teeth for cutting trees for food, lodges and dams. Two sets of eyelids - one set is clear for underwater vision.

Grebe



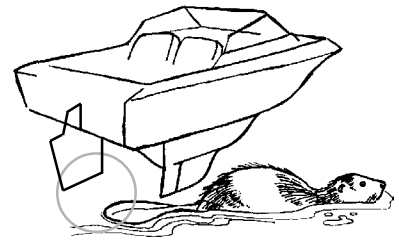
Swims low in the water and therefore is difficult to see. They are excellent divers.

## Lesson four continued

# Adaptations and human inventions

### BOAT RUDDER

The boat rudder was designed to imitate the steering effects of the tail of an otter or beaver when it is swimming.

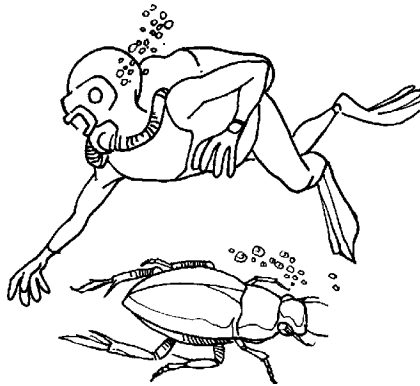
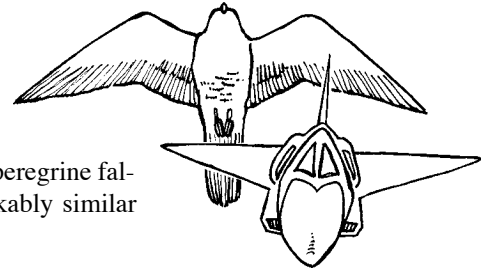


### CANOE PADDLES

Like a duck's webbed feet, they are broad to maximize propulsion when pushed through the water.

### AIRPLANE WINGS

Like the feathered wings of a bird, they can be altered to allow for more surface area in slower flight or swept back for speed. A peregrine falcon and a jet fighter have remarkably similar wing shapes.



### SCUBA TANKS

Scuba tanks allow a person to breathe underwater by storing oxygen, just like a diving beetle stores air for its extended dives in a chamber under its wing covers.

### CAMOUFLAGE CLOTHING

Soldiers wear camouflage clothing to avoid being spotted by the enemy, much like the splotchy colours of a frog hide it in vegetation from predators.

