

Adaptations of Seed Plants

Key Words • adaptation • survive • habitat • root • stem • leaf • flower • seed • fruit



Getting the Idea

A cactus and a water lily are both plants. They have the same parts, but they look very different. A cactus cannot live in a pond, but a water lily can. A water lily cannot live in a dry desert, but a cactus can. Each plant has features that help it live and grow in a certain place. In fact, all plants do.

Adaptations

All living things have adaptations. An **adaptation** is a feature that helps a living thing survive. To **survive** means to stay alive. An adaptation can be a body part, such as a root or a tail. It can also be a way that a living thing acts or changes when something around it changes.

Plants need different adaptations to survive in different habitats.

A **habitat** is the place where a plant or animal lives. The plant or animal must find everything it needs to live in its habitat.

Roots

Remember that all plants have roots. A **root** is a plant part that takes in water and nutrients from the soil. Roots also store food and water. And roots help the plant stay in place.

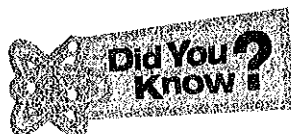
Carrots have very long, thick roots. The roots grow down deep into the soil to find water. Water lilies have very long, thin roots. The roots reach down through the water to the soil at the bottom of the pond. In a desert, the rain dries up quickly. Cactuses have roots near the top of the soil to get the rainwater quickly. These roots are adaptations that help each kind of plant survive in its habitat.

Stems

The **stem** of a plant moves water and nutrients from the roots to the leaves and other parts of the plant. It also holds up the leaves and the flowers or fruit of a plant.

The stem of an apple tree is its trunk. This stem is thick and woody. It holds up the heavy apples and many branches. It also protects the tree during its long life. The stems of corn plants and sunflower plants are also thick, but they stay green and can bend. These stems let the plants turn toward sunlight.

The stem of an ivy plant can climb high. This feature helps the ivy leaves reach sunlight. The stem of a cactus stores water. This feature helps the cactus survive when there is no rain. Some stems have thorns that help protect the plant from animals.



South Carolina's state tree is the *Sabal palmetto*. Its very sturdy stem is an adaptation that helps it survive strong winds and floods.

Leaves

You have learned that **leaves** are plant parts that make food for the plant. To make food, leaves must take in sunlight.

Plants that live in shady places need big leaves to take in as much sunlight as possible. Plants that live in sunny places can stay alive with small leaves.

A water lily has leaves that are big and flat. The leaves float on the surface of the water, so they can take in sunlight. A pine tree's needles are its leaves. They are thin and waxy. The leaves' waxy coating helps protect them from freezing and from losing too much water. Their thin, narrow shape also helps keep them from losing water.

Flowers

A **flower** is a plant part that makes seeds. A **seed** holds a new plant and keeps it safe.

Flowers have many colors, shapes, and sizes. Flowers also have special smells. These features attract bees, other insects, and birds. The animals help the plant reproduce by spreading pollen.

Fruits

Fruits form around seeds. A **fruit** is a plant part that stores seeds and protects them. Fruits also help spread seeds to new places.

Some fruits are soft and juicy. Tomatoes, peaches, and cucumbers are some examples. Animals like to eat this kind of fruit. Animals spread the seeds in their wastes, or droppings.

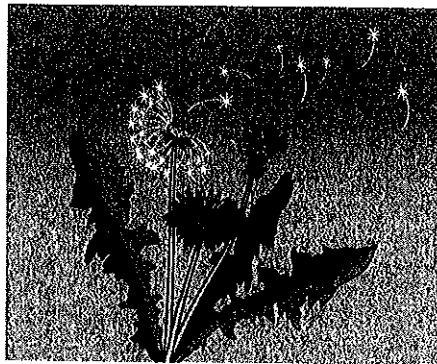
Other fruits are hard and dry. A coconut is a fruit with a hard shell. The shell protects the seed inside it. Walnuts and pea pods are other examples.

Seeds

A seed holds a new plant and some food. If the seed is in a place where it can get more food, sunlight, and water, the new plant is likely to grow.

Plants produce many seeds at a time. Most seeds will not survive. To survive, seeds have to move away from the plant. Seeds have different features that allow them to be dispersed, or spread.

Some seeds can float away on water to find a new place to grow. Dandelions, milkweeds, and maple trees have seeds that are very light. Their seeds have tiny hairs or parts like wings. The wind blows such seeds to new places.



You have learned that animals spread some seeds in their droppings. Some other seeds have tiny hooks. These seeds can hold onto an animal's fur and fall off later. You may even spread these seeds if they stick to your clothes.

Discussion Question

A plant lives in a very dry habitat. What adaptations would you expect this plant to have?



Lesson Review

1. What is a habitat?
 - A. the place where a plant or animal lives
 - B. a feature that helps a living thing survive
 - C. the part of a plant where seeds form
 - D. the part of a plant that makes food
2. Which one is an adaptation to life in a cold place?
 - A. very light seeds
 - B. wide leaves that float
 - C. thin, waxy leaves
 - D. bright flowers
3. Which is NOT a way that seeds are spread?
 - A. They hook onto an animal's fur.
 - B. The wind blows them around.
 - C. They are eaten by animals and left in another place.
 - D. They dry out while they are in the fruit.
4. Which plant would MOST LIKELY have large, flat leaves?
 - A. a plant living in a shady place
 - B. a plant living in a very cold place
 - C. a plant living in a place with lots of sunlight
 - D. a plant living in a place with very little rain

Adaptations of Animals

Key Words • camouflage • hibernate • migrate



Getting the Idea

You have learned that plants have adaptations that help them stay alive. Recall that an adaptation is a feature that helps a living thing survive. Animals have adaptations, too. Some of these features are body parts, such as fur or a long neck. Other adaptations are ways of acting. In this lesson, you will learn how these features help animals survive.

Animal Body Parts

All animals have body parts that help them survive where they live. These structures help them move, protect themselves, and find food.

Moving All animals have body parts for movement. Being able to move helps animals find shelter, space, and food. If there is not enough food in one place, animals can move to a new area.

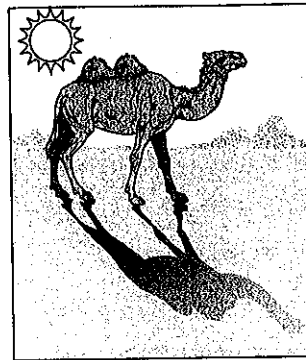
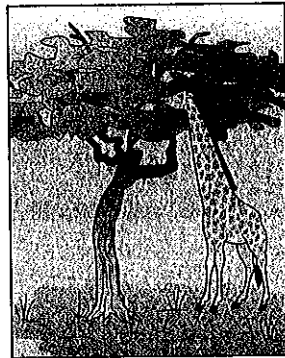
Animals with legs walk, run, jump, and climb. Apes use their arms to swing through trees. Birds, bats, and many insects have wings that allow them to fly. Fish swim through water by moving their tails and fins. Snakes use their muscles to slither across the ground. Rabbits, frogs, and grasshoppers can move by hopping.

Eating and Drinking All animals have body parts that let them take in food and water. You have a mouth, teeth, a tongue, and jaws. These body parts are adaptations for the kinds of food you eat. Meat eaters have pointed teeth for biting and tearing. Plant eaters have flat teeth for grinding. Humans have pointed teeth and flat teeth, for eating both meat and plants.

Birds have different kinds of beaks for eating different foods. A parrot has a short, strong, hooked beak for cracking seeds and biting fruits. A duck has a flat, rounded beak for straining food from water. A heron has a long, sharp beak for spearing fish.

A butterfly has a mouth shaped like a drinking straw. This body part lets butterflies sip nectar from flowers. A grasshopper has strong jaws for crushing grasses and leaves.

Some animals live where food is hard to find. Giraffes live in the grasslands of Africa. A few trees grow in the grasslands. Giraffes' long necks and tongues let them eat leaves from the trees. Camels live in desert areas, with little water and few plants. Camels store fat in their humps. When they do not have food, they live on the fat. They can also live for days without drinking.



Breathing Animals have different body parts for breathing. You have lungs for breathing air. Your body gets the oxygen it needs from air. Many animals that live on land breathe with lungs. But insects do not have lungs. Most insects take in air through holes in their sides.

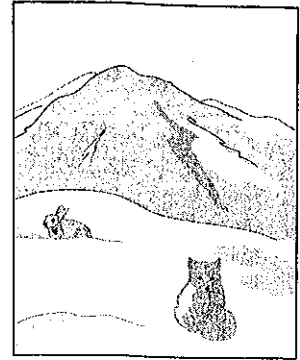
Most animals that live in water breathe with gills. Gills let animals get oxygen from water instead of air. Fish, shrimp, and clams are some animals with gills.

You learned in Lesson 9 that tadpoles breathe underwater, but adult frogs breathe air. Tadpoles have gills, and adult frogs have lungs. But adult frogs can also get oxygen from water. They take in oxygen through their skin.

Body Coverings Body coverings also help animals stay alive. In cold habitats, many animals have thick fur to keep them warm. They may also have a thick layer of fat, called blubber. Blubber helps keep seals, polar bears, and whales warm.

Claws and quills are part of some animals' coverings. A claw is a sharp, curved nail at the end of an animal's toe. Cats, bears, and hawks are some animals that have claws. Animals use claws to kill other animals for food. Animals also use claws to protect themselves. Porcupines protect themselves with their quills. A quill is a sharp spine that grows out of an animal's skin.

An animal's coloring can help it hide when it is hunting or being hunted. A color or pattern that helps an animal hide is called **camouflage**. Camouflage helps an animal blend in with its surroundings. The arctic hare and arctic fox pictured here have white fur. Their fur helps them hide in the snowy places where they live. A zebra's stripes help it blend in with tall grasses.



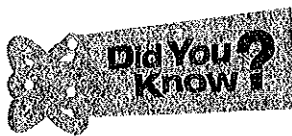
Animal Behaviors

Animals have behaviors that help them survive. A behavior is a way of acting. Animals may change their behavior as their habitat changes, such as at night or with the seasons.

Lions live in hot places. They hunt mainly at night, when it is cooler. During the day, they sleep in the shade. Most desert animals stay out of the sun during the day. When the sun goes down, the animals start looking for food.

Many animals **hibernate**, or rest in a way that helps them survive in winter. Their hearts beat much more slowly. The temperature of their bodies goes way down. They seem to be dead, but they are not. Their bodies are saving energy. A hibernating animal uses so little energy that it does not need to eat. Hibernating lets it live through winter, when there is very little food.

Animals that hibernate eat a lot of food in late summer and fall. The animals store up fat in their bodies. Then they find shelter for the winter. Groundhogs hibernate in holes in the ground called burrows. Bats may hibernate in caves. Frogs hibernate in the mud at the bottom of streams and ponds. Many insects hibernate. Ladybugs may spend the winter under piles of leaves.



When a groundhog hibernates, its body temperature drops. It changes from 36°C to less than 4°C . Its heart rate slows down from 100 beats per minute to four beats per minute. It takes just one small breath every six minutes.

Some animals get through winter by traveling to warmer places. In spring, they travel back again. These animals **migrate**, or move from place to place in a pattern with the seasons.

You may have seen flocks of ducks or geese flying in fall or spring. The flocks fly in a V when they migrate. The bird at the tip of the V is the leader. The birds fly south to places with food, water, and shelter for the winter months. In spring, the birds fly north again to lay eggs and raise their young.



Many other animals migrate. Monarch butterflies and moose are two examples. In fall, monarch butterflies fly south from the United States and Canada to Mexico. They spend the winter in that warm place. In spring, they fly back to their summer homes. Moose eat the leaves and bark of trees and shrubs. Moose usually migrate at least twice a year to places where they can find more food.

Animals also have behaviors for defense, or protection. Some animals protect themselves by fighting. Others, such as deer and rabbits, run away when they sense danger.

Some animals trick their enemies. A stick insect looks like a twig. When it needs to hide, it stops moving, so it is hard to find. Opossums trick their enemies by playing dead, or pretending to be dead.

Some animals protect themselves by spraying liquids. Skunks drive away their enemies by spraying a liquid that has a very bad smell.

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Discussion Question

Compare the ways humans and animals live through cold winters. How are the ways the same? How are they different?



Lesson Review

1. Which of these does NOT help an animal protect itself from enemies?
 - A. having claws
 - B. playing dead
 - C. having blubber
 - D. having quills
2. Which animal breathes with gills?
 - A. clam
 - B. camel
 - C. grasshopper
 - D. adult frog
3. When an animal hibernates, it
 - A. moves to a warmer place.
 - B. stores food.
 - C. saves energy.
 - D. stays active.

4. Camouflage is an adaptation that helps animals
- A. move around.
 - B. stay warm.
 - C. blend in with their surroundings.
 - D. take in food.
5. When an animal migrates, it
- A. saves energy.
 - B. defends itself.
 - C. stores food.
 - D. moves with the seasons.