



ESSENTIAL QUESTION

What Is Adaptation?



Engage Your Brain

Find the answer to the following question in this lesson and record it here.

Watch out! Don't get bit by that... caterpillar? What type of adaptation does this caterpillar have?



ACTIVE READING

Lesson Vocabulary

List the terms. As you learn about each one, make notes in the Interactive Glossary.

Signal Words: Details

This lesson gives details about how living things are suited to where they live. Signal words link main topics to added details. For *example* and *for instance* are often used as signal words. Active readers look for signal words that link a topic to its details.

A Place to Call Home

Where are living things found on Earth?

They can be found deep underground, high up in the air, and everywhere in between!

ACTIVE READING As you read this page, put a star next to the main idea of each paragraph.

Think about all the different kinds of living things on Earth. They each live in a different location. The place where a living thing lives is called its **habitat**. There are many different kinds of habitats. Some habitats are hot and dry. Other habitats are frozen. Still other habitats are found deep under the ocean.

All of a living thing's needs must be met within its habitat. Because of this, only certain kinds of living things can live in certain habitats. For example, an animal that has gills for breathing under water cannot live in a dry habitat. A plant that needs very little water cannot live in a wet habitat. As you look at the different types of habitats shown on this page and the next, ask yourself why each plant or animal is found in a certain kind of habitat.



mountain



jungle



Where Do I Live? Write the type of habitat in which these animals are found.









Habitats on Earth

Each type of habitat is home to different plants and animals. Which type of habitat shown here is most similar to a habitat found where you live?



polar



ocean



desert



grassland



Adaptations

Living things have many similarities. They also have many interesting differences.

ACTIVE READING As you read this page, underline the definition of *adaptation*.

Deserts are home to many kinds of snakes. This is because snakes have characteristics that help them survive in a desert. For example, snakes have tough, scaly skin that keeps them from drying out.

A characteristic that helps a living thing survive is called an **adaptation**. Suppose an animal is born with a new characteristic. If this characteristic helps the animal survive, the animal is likely to reproduce and pass on the characteristic to its young. As long as the animal's habitat doesn't change, young that have this characteristic are also likely to survive and reproduce. Over time, the adaptation becomes more common in the population. In this way, populations of plants and animals become adapted to their habitats.

These rabbits live in very different habitats. Because of this, they have different adaptations.

An arctic hare lives in a cold habitat. It has thick fur to keep it warm and small ears that keep heat from being lost.

A jackrabbit lives in a hot habitat. Jackrabbits have large ears that help keep their blood cool.

A large circular inset image showing an ostrich running across a golden field. The ostrich is dark brown with a long neck and long legs. In the top right corner of the circle, there is a purple rounded rectangle with the word "ostrich" in white. The background of the entire page is a blurred image of a savanna with trees and a bright sky.A photograph of an adult emu and its chick. The adult emu is standing in a dry, open field, facing left. The chick is in the foreground, also facing left. A purple rounded rectangle with the word "emu" in white text is overlaid on the bottom right of the image.

Physical Fitness

Whether blending in or standing out, physical adaptations help organisms survive.

ACTIVE READING As you read the next two pages, circle signal words that alert you to details about the main idea.



The bright color of this rose attracts pollinators, but the thorns keep plant-eating animals away.

Can you see the owl in this picture? The owl is camouflaged to look like bark.



Some adaptations are differences in the bodies of plants and animals. These are called physical adaptations. For example, sharp teeth, webbed feet, and large eyes are physical adaptations.

Some physical adaptations protect living things from being eaten. For example, roses have sharp thorns that help keep their stems from being eaten. Other physical adaptations help to keep an animal hidden. This type of adaptation is called *camouflage* [KAM•uh•flazh]. Green lizards hiding in green grass are camouflaged.

(l) ©Clive Boursnell/Getty Images; (r) ©FPA/Alamy

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Catching Flies

Bright coloring on an animal is often a warning that an animal is dangerous. Many animals know that paper wasps, like the one shown below, have a painful sting. The black and yellow hoverfly doesn't have a stinger. It is completely harmless. But because it looks like a wasp, animals will think twice before trying to eat it. This adaptation is called *mimicry*.

► Draw a line from the chameleon's tongue to the insect it would most likely eat.



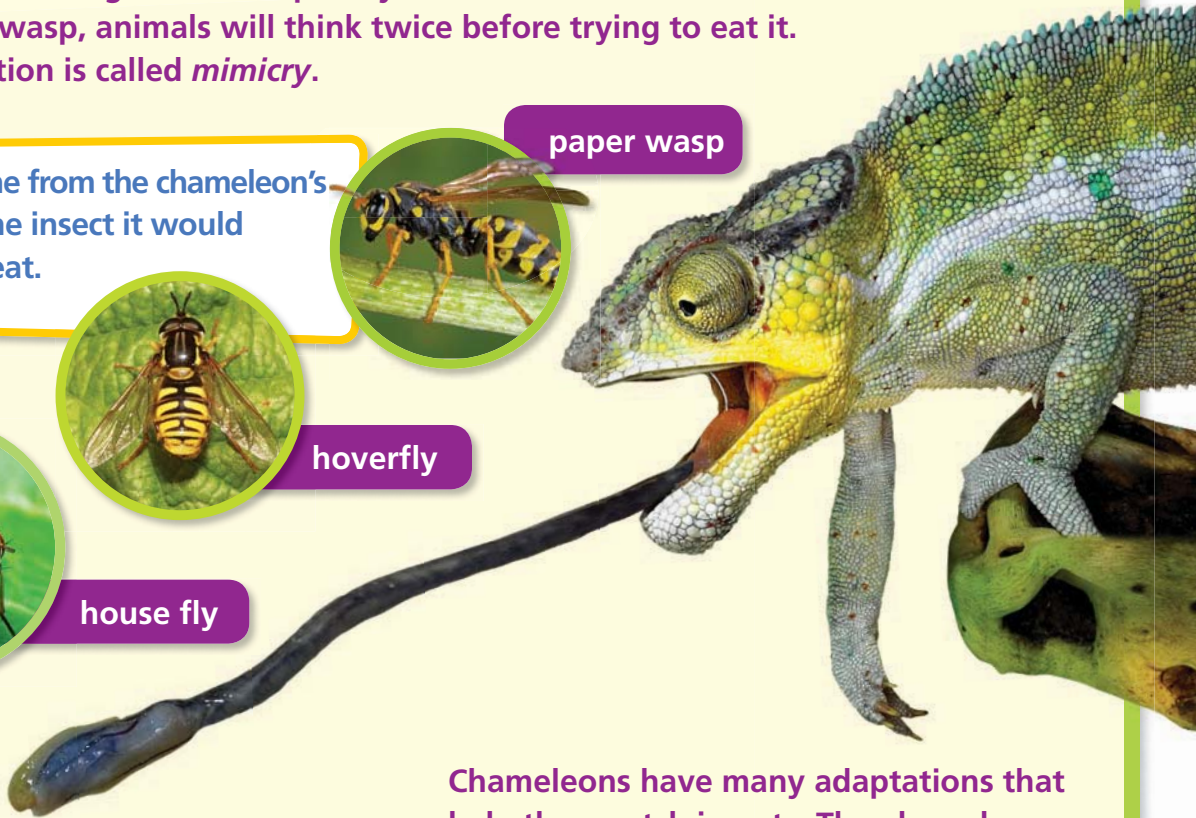
house fly



hoverfly



paper wasp



Chameleons have many adaptations that help them catch insects. They have long, sticky tongues that capture an insect in the blink of an eye. They have eyes that move in all directions, helping them see not only food but also possible danger. They also have feet and a tail that wrap around branches, making them excellent climbers. With all of these adaptations, a tasty fly must look like a wasp to avoid being eaten by a chameleon!

Animals that hunt, such as eagles, have adaptations that help them catch food. Eagles have very good eyesight. They also have sharp claws on their feet, which they use to capture their food.

Many plants have adaptations that help spread their seeds. Some seeds can be carried by the wind. Other seeds are inside berries. When the berries are eaten, the seeds are carried to a new location.

(chameleon) ©Bob Elsdale/Getty Images (fly) ©Jatub Typiak/Alamy (wasp mimic) ©Prenaphotos/Alamy (paper wasp) ©Blickwinkel/Alamy

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On Your Best Behavior

The way living things act is called behavior. Some behaviors are adaptations that help animals survive.

ACTIVE READING As you read the paragraph below, circle examples of instinctive behavior and underline examples of learned behavior.

Some things that animals do seem to come naturally. Babies do not have to be taught how to cry. Spiders are not taught how to spin webs. Behaviors that animals know how to do without being taught are called **instincts**. Animals have to learn other types of behaviors. For example, a lion cub is not born knowing how to hunt. It learns to hunt by watching its mother. Raccoons learn to wash food by watching other raccoons.

Many animals have behaviors that help protect them from predators. When an octopus is frightened, it releases ink into the water. If the octopus is being attacked, the animal attacking it will not be able to see, and the octopus can escape.

Some bats are *nocturnal*. This means they are active at night and sleep during the day. This allows bats to hunt insects that are active only at night.



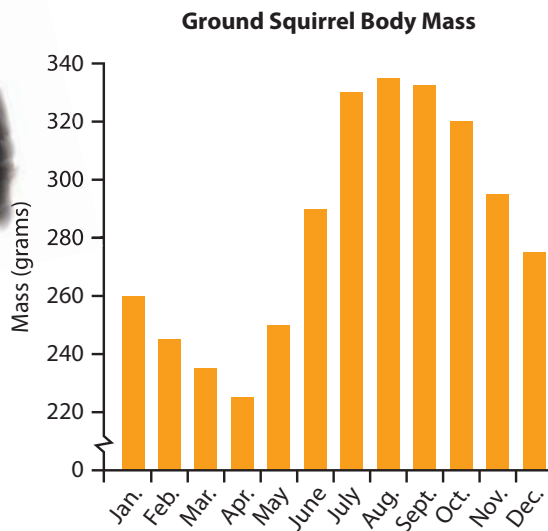
Each year, millions of snow geese migrate south in autumn and north in spring.



DO THE MATH

Interpret Data in a Bar Graph

Ground squirrels hibernate. They must eat a lot during the spring, summer, and fall to store up enough energy to survive hibernation. Study the graph below.



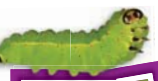
About how much mass does a ground squirrel have in March?

During which month do ground squirrels start to hibernate? How do you know?

Some animals move to different locations at certain times of the year to find food, reproduce, or escape very cold weather. This instinctive behavior is called *migration*. Many birds, butterflies, and some bats migrate long distances.

Other animals hibernate. *Hibernation* is a long period of inactivity that is like sleeping. But hibernation is not the same as sleeping. When an animal hibernates, its body processes slow down and it stays inactive for months. Can you imagine taking a three-month nap?

The way that animals act toward other animals of the same type is called *social behavior*. Honeybees have very complex social behavior. They communicate using movements called the "waggle dance." A bee that finds food will return to the hive and do a waggle dance. The pattern of the dance gives other bees a lot of information! The dance communicates which direction to go, how far away the food is, how much food there is, and even what kind of food it is!



The Circle of Life



All living things grow and develop. The way that living things develop can be an adaptation.

ACTIVE READING Circle two different examples of organisms whose life cycles keep adults and young from competing for food.

Living things go through stages of growth and development called a *life cycle*. A living thing's life cycle is related to its habitat. Because of this, differences in life cycles are a type of adaptation.

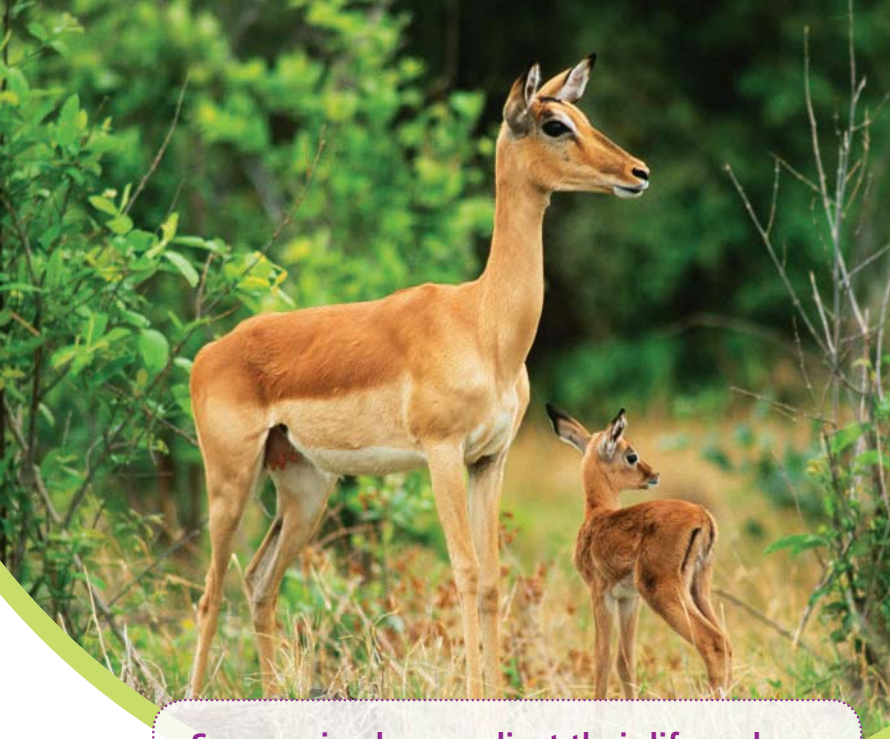
Most frogs are adapted to live near water. A frog's life cycle starts when its eggs are laid in water. When the eggs hatch, tadpoles emerge. Tadpoles live in water until they grow legs and lungs. At this point, they are ready to live on land. In places where water tends to dry up quickly, tadpoles develop more quickly. This difference, or variation, in frog life cycles helps tadpoles survive.

Tadpoles and adult frogs live in different places, and they eat different foods. This is another kind of adaptation. Adult frogs and tadpoles don't compete with each other for food. This helps more frogs survive. Many other living things have similar adaptations. For example, caterpillars eat plant leaves and adult butterflies sip nectar from flowers.



salmon eggs

Adult salmon live in the ocean, which is a dangerous place for young salmon. Adults migrate from the ocean to shallow rivers to lay eggs. More young salmon are able to survive in rivers.



Some animals can adjust their life cycle to changes in their habitat. In a very dry year, a pregnant impala can wait up to a month, until rain falls, to give birth. This life cycle variation helps make sure there is enough food and water for the young impalas to survive.

A female impala has one or two calves and then spends months feeding and protecting them. A female salmon lays thousands of eggs and then returns to the ocean. What are some advantages of each type of life cycle?

It does not rain very often in the desert. When it does rain, the seeds of desert wildflowers, such as those shown below, immediately begin to grow. The plants bloom, make new seeds, and complete their whole life cycle within a few weeks! Explain how the life cycle of desert wildflowers helps them survive in the desert.



luna moth caterpillar



adult luna moth

