



ESSENTIAL QUESTION

What Are Some Adaptations to Life on Land?



Engage Your Brain

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

Is that a pine cone with eyes? No, it's a pangolin! Pangolins have strong claws for climbing and digging, and their strong tail wraps around objects. Where might you find a pangolin?



ACTIVE READING

Lesson Vocabulary

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

Visual Aids

This lesson has many photographs of animals and plants that live on land. Active readers pause their reading to review the photographs and captions and decide how the information in them adds to what is provided in the running text.

Take a Walk in the Woods

Forests are habitats filled with trees. Many living things call forest habitats their home.

ACTIVE READING As you read this page, circle the types of organisms found in a forest.

Some of the largest forests in the United States are temperate forests. Temperate forests have warm summers and cold winters. Trees that grow in a temperate forest have wide leaves that absorb a lot of sunlight. Many kinds of plants grow beneath the trees. These plants are adapted to live with less light than plants that are not shaded. Vines, such as ivy, climb the trees to reach light.

Many animals live in a forest. Some of them have adaptations that help them climb or live in trees. Birds are common in forests. Many forest birds have feet that help them perch on branches. Insects are also common in forests. Many of them have special mouth parts that let them bore into wood. These insects can live under a tree's bark. Woodpeckers are adapted to eat insects that burrow into wood.

Describe the Temperate Forest	Describe Adaptations for Living Here





Woodpeckers eat insects that live in trees. They use their hard, pointy beak to drill holes in the tree.



Young deer, called fawns, have spots on their fur. When a fawn is curled up on the forest floor, the spots help camouflage it.

Most trees in temperate forests are *deciduous*. Their leaves change color as nights become longer in the fall. They lose their leaves before winter begins to help prevent water loss in the cold, dry air. Before the leaves fall, deciduous trees pull important nutrients from the leaves into the trunk and stems. When the weather becomes warmer in spring, the trees sprout new leaves.



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Rain, Rain Every Day

Deep in the jungles live amazing plants and animals that can't be found anywhere else on Earth.

ACTIVE READING As you read this page and the next, underline plant adaptations and circle animal adaptations.

Tropical rain forests, often called jungles, are warm and rainy all year. As a result, many different kinds of plants live there. The tallest trees reach out over the top of the forest to get sunlight. Another layer of trees spreads below those giants. With so many trees, not much light reaches the forest floor. A third layer of plants live close to the ground. These are adapted to low light. Some plants, called *epiphytes* [EP•ih•fyts], have adapted to reach light by living in the trees.

Daily rain washes dirt into rivers. As a result, the soil is very thin in a tropical forest. Because their roots cannot grow very deep, large trees in tropical forests have special adaptations that help keep them from falling over. Some trees have roots that grow down from the branches to prop the tree up. Other trees have roots that make walls that spread out around the tree.



Buttress roots form walls at the base of trees. This helps keep the tree from falling over in shallow soil.

Describe the Tropical Forest

Describe Adaptations for Living Here





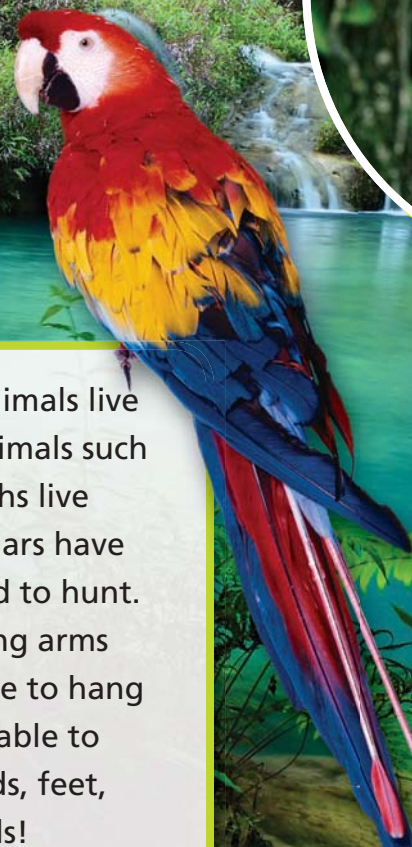
A howler monkey's calls are very loud. They can be heard up to four kilometers away! This helps howler monkeys communicate in a dense tropical forest.



This plant is an epiphyte. It gets the water it needs from the air and rain. Living in the trees allows it to get enough sunlight.

Many different types of animals live in a tropical forest. Larger animals such as jaguars, monkeys, and sloths live in and around the trees. Jaguars have sharp claws to climb trees and to hunt. Sloths and pangolins have long arms and strong claws that they use to hang from branches. Monkeys are able to grip branches with their hands, feet, and sometimes even their tails!

Many animals in a tropical forest are brightly colored. Some bright colors warn predators that the colorful animal is poisonous. For other animals, bright colors help them find their family in the dimly lit forest environment.



Epi- means "on top of" and *-phyte* means "plant." Using this information, write your own definition for *epiphyte*.

Fields of Gold



African hyenas are dog-like hunters and scavengers. They have powerful, bone-crushing jaws and live in packs with complex social behavior.

In some habitats, there is not enough rain for many trees to grow.

What grows in place of trees?

ACTIVE READING As you read this page and the next, underline the types of animals that eat plants. Circle the types of animals that eat meat.

Grasses are the main plant life in a **grassland**. Grasslands receive less rain than forests, which is why few trees grow in grasslands. Grassland fires are common.

The long, narrow leaves of grasses keep them from losing very much water. Grasses have large root systems in which energy is stored. This helps them grow back quickly after a fire or after they've been eaten. Plant eaters in African grasslands, shown here, include elephants, zebras, giraffes, and gazelles. They have flat teeth that help them chew grass.

Many grassland animals are very fast runners. Gazelles and cheetahs are two of the fastest animals on earth. Grassland hunters have long legs, sharp teeth and claws, and powerful jaws. This helps them chase down and capture their prey. Lions' golden color helps them blend with the grass. Smaller insect-eating animals, such as meerkats, live in burrows in African grasslands. Eagles and vultures are meat eaters that search for food from far overhead. Their keen eyesight helps them spot food from high above the ground.

Describe the Grasslands	Describe Adaptations for Living Here

In North America, grasslands are also known as prairies. Bison, shown below, were once very common on the prairies. Like elephants and zebras, bison have flat teeth that help them chew grass. Bison also have more than one stomach. This helps them digest the tough fibers in grass.

Coyotes also live in prairies. They hunt small animals such as rabbits and prairie dogs. These small animals have strong front paws that help them dig. Since there are few hiding places in grasslands, living underground in burrows helps protect these animals from grassland hunters.

A photograph of a herd of bison in a vast, open prairie landscape. In the foreground, two bison are prominently featured, looking towards the camera. They have thick, brown fur and curved horns. The ground is covered in tall, dry grass with some green patches. In the background, more bison are visible grazing, and the horizon is flat under a clear sky.

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(top) © Fotolia; (giraffe) © iStockphoto; (zebra) © iStockphoto; (background) © iStockphoto; (giraffe) © iStockphoto; (zebra) © iStockphoto; (background) © iStockphoto



Thorny trees called acacias are found in African grasslands. Giraffes eat the leaves of these trees. Their mouths are tough, so the thorns don't bother them. A giraffe's long neck helps it reach leaves high up in

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Some Like It Dry

Some habitats get almost no rain all year. Few plants and animals can live in such dry places.

ACTIVE READING As you read this page, circle signal words that alert you to details about the main idea.

Sandy. Rocky. Dusty. DRY! These words describe a **desert**, which is a place that receives very little rain. Lack of water makes a desert a hard place to survive. Some deserts are very cold. Other deserts are the hottest places on Earth. Plants and animals must have special adaptations to live in deserts.

Many desert plants, such as these Arizona cactuses, have thick bodies that store a lot of water. Their stems and leaves have a tough, waxy coating. They often have very small leaves. This helps keep water from escaping into the dry air.

Desert animals also have adaptations that help them conserve water. For example, many animals in hot deserts are nocturnal. They sleep during the heat of the day and only come out at night, when the desert is much cooler.

Describe the Desert	Describe Adaptations for Living Here

In the North African and Middle Eastern deserts, camels are common animals. Camels have wide feet for walking on sand. They are able to drink large amounts of water and go a long time without drinking. Camels store all of their fat in their humps. This helps their bodies cool more easily. A camel's long lashes protect its eyes from blowing sand. A camel can also close its nostrils during a sandstorm to keep sand out of its lungs.



This American sidewinder rattlesnake is adapted to move over the smooth desert sand. It takes sideways "steps" with its body, so that it doesn't slip in the sand.



DO THE MATH

Make a Bar Graph

Deserts that are very hot during the day often cool down quickly after sunset. This happens because there is no cloud cover to trap the heat. In the Sahara, in Africa, daytime temperatures may reach as high as 55°C (131°F). The temperature may drop to 10°C (50°F) at night. Plot this information on a bar graph below.

Some Like It Cold

A tropical forest isn't the only place where trees are green all year round. Some trees are tough enough to stay green even when they're covered with ice!

ACTIVE READING As you read this page, find and underline the meanings of *conifer* and *taiga*.

Pines, firs, and spruces are evergreen trees—they stay green all year long. They live in the **taiga** [TY•guh], a far northern habitat with very cold winters and short, warm summers. Trees called conifers are common in the taiga. *Conifers* are evergreen trees that grow seeds inside of cones.

Conifers are well adapted to the taiga. They have pointed tops and flexible branches. This helps them shed snow and allows them to bend without breaking when they're weighed down with ice. They are also dark green in color. This helps them absorb more light from the sun. In addition, the cones that contain seeds are hard. This helps protect the seeds inside from harsh weather and hungry animals.

lynx

Describe the Taiga

Describe Adaptations for Living Here



Most conifers have needle-like leaves.



Animals that live in the taiga have many cold-weather adaptations. Animals such as wolverines and lynxes have thick fur coats. The color of their fur helps camouflage them among the trees.

During the summer, many birds live in the taiga. These birds feed on berries and insects that are abundant during the summer months. Most of these birds migrate south in autumn. This helps the birds avoid the harsh winter months when few berries and insects can be found. The birds that stay in the taiga during the winter have thick layers of feathers. These feathers insulate the birds from the cold.

A moose grows a thicker coat of fur for the long winter.



This crossbill's beak is adapted to open pine cones. The bird can then eat the seeds hidden inside the cones.



Life on Ice

Some habitats are winter wonderlands all year long!

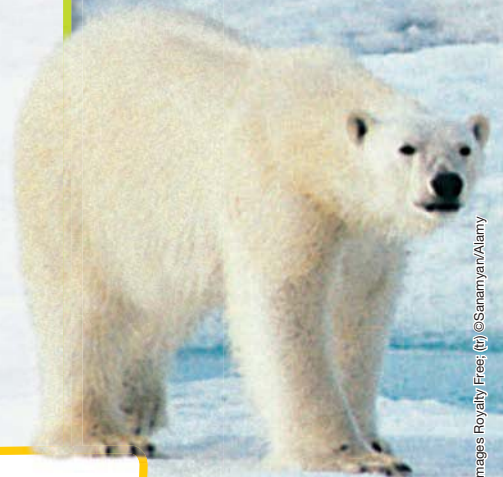
ACTIVE READING Look at the photos and read the captions on this page and the next page. Place a star next to the animal that changes color.

Habitats that are near the North Pole and South Pole are called **polar** habitats. In some areas, called the *tundra*, snow on the surface of the ground melts during the summer. The ground below stays frozen, but the thin layer of soil on top is just enough to allow plants to grow. These plants must grow and reproduce before the ground freezes again in late summer. The arctic willow, shown above, is one example of this kind of plant. It is a small, woody plant that is dormant all winter. When summer arrives it sprouts furry leaves, grows flowers, and makes seeds all in a few short months.

In places closest to the poles, the ground is always frozen. No plants can survive here. Plantlike organisms called *lichens* [LY•kuhns] live on the rocks. Many animals, including reindeer, eat lichens in polar habitats.



This arctic willow plant has very fuzzy leaves. The fuzz stops snow from collecting on the leaves.



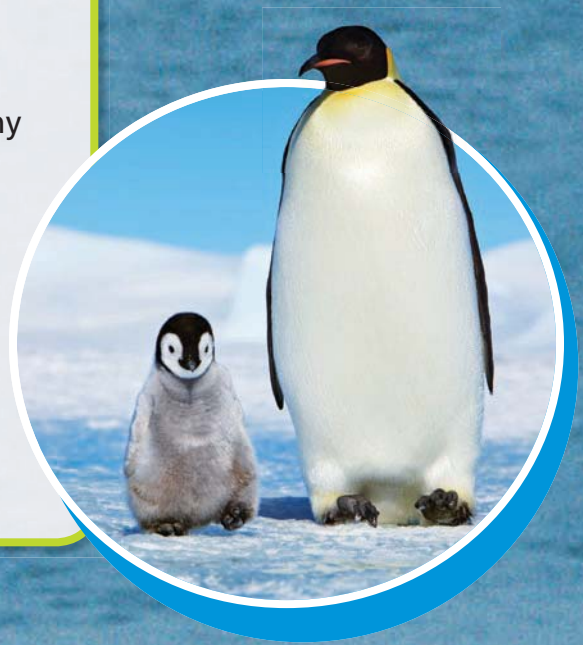
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Describe Polar Habitats

Describe Adaptations for Living Here



Polar habitats that are covered with ice year-round are home to many animals. Penguins, like the emperor penguins shown here, live near the South Pole. They are excellent swimmers and dive for fish in the icy ocean. These amazing hunters have thick layers of fat and a layer of water-proof feathers.



Polar bears live near the North Pole. They hunt seals and are excellent swimmers. Both polar bears and seals can close their nostrils. This keeps water from entering their noses when they swim.



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A willow ptarmigan has white feathers in winter. This camouflages the bird in the snow. The feathers on its legs and feet help to keep it warm.



In the summer, ptarmigans shed their white feathers and grow brown feathers. This camouflages them against the brown soil and tundra plants.