

Habitats and the Environment

A Science A-Z Life Series

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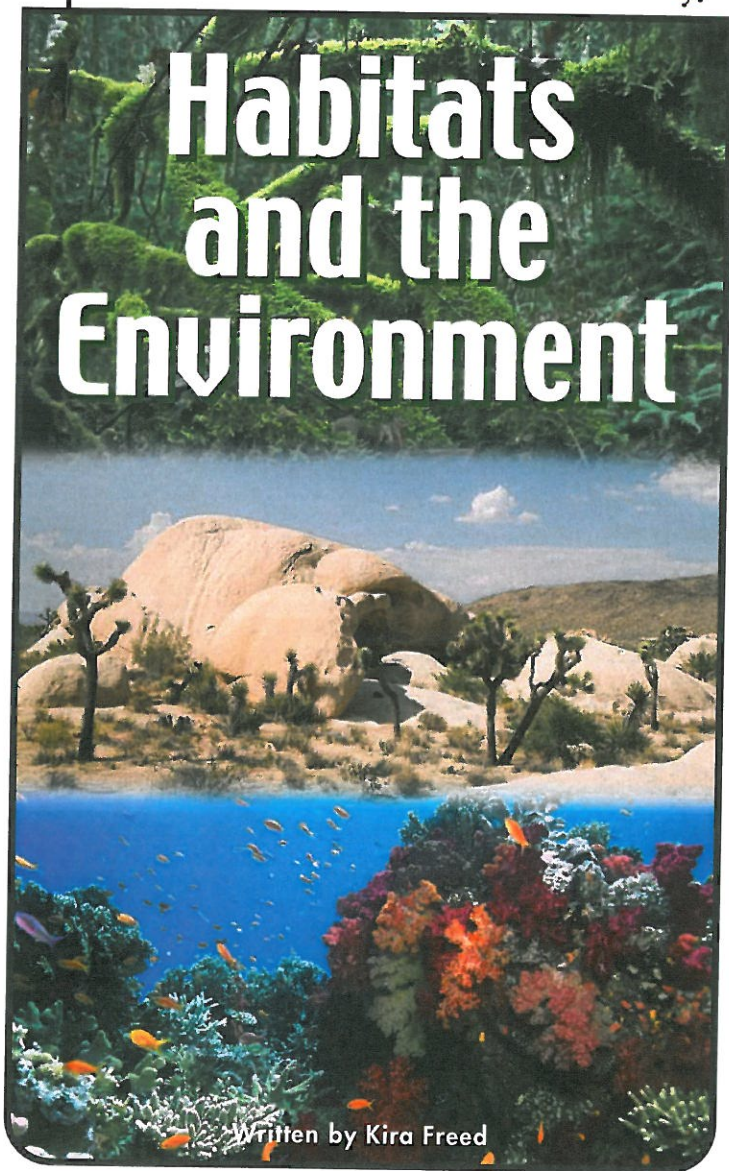


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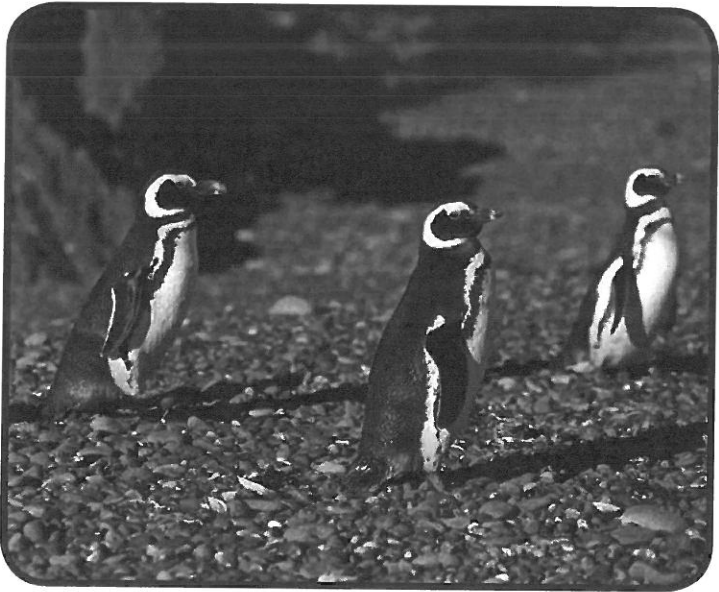
Habitats and the Environment



Written by Kira Freed

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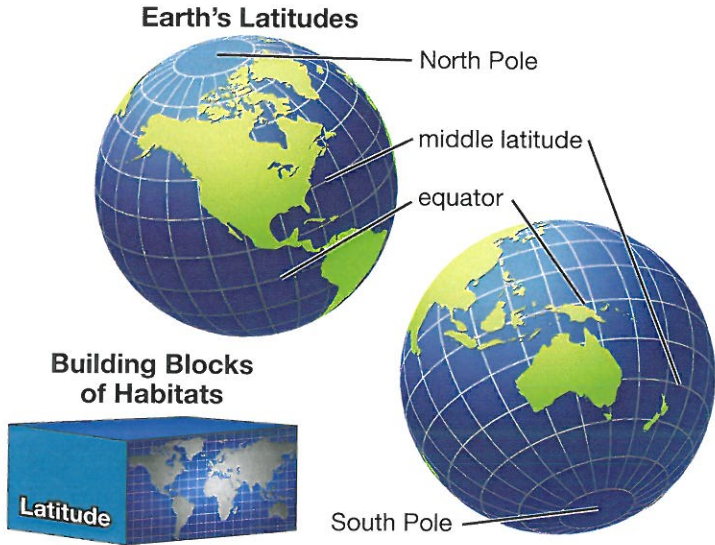
Introduction

Can you imagine a wild polar bear living in Hawaii? How about a palm tree growing in Antarctica? You probably know that these things would never happen, but do you know why not?

A **habitat** is a place where a living thing lives. But it is not just a home. A habitat provides a living thing with the food, water, air, and shelter it needs to **survive**. It has many parts that all work together. In this book, you will learn about what makes up a habitat and how habitats are different for different living things. By the time you finish reading, you will know why the pictures on this page could not be real.



What's wrong with these photos?

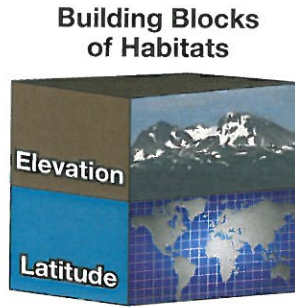


The Building Blocks of Habitats

Earth has many types of habitats. What causes one habitat to be different from another habitat? To answer this question, let's explore the building blocks of habitats.

The first building block is **latitude**. Latitude is a measure of how far a place is from Earth's equator, or middle. The bands of color in the diagram on this page show different latitudes. As Earth spins, the Sun's energy warms parts of the planet differently. The latitudes closer to the equator are warmed more than the polar regions, which are far from the equator.

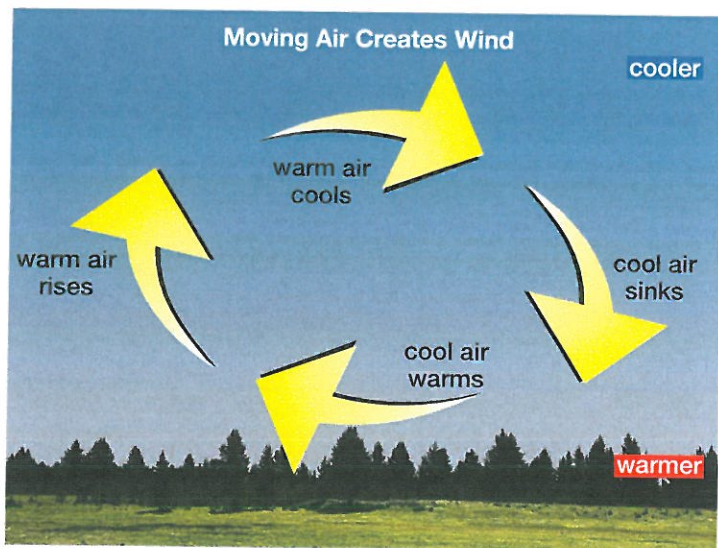
In each band of latitude, some land is higher than other land. **Elevation**—how high or low an area is—is the second building block of a habitat. Areas of low elevation are warmed more by the Sun’s energy than areas of high elevation, which are cooler. Why is that?



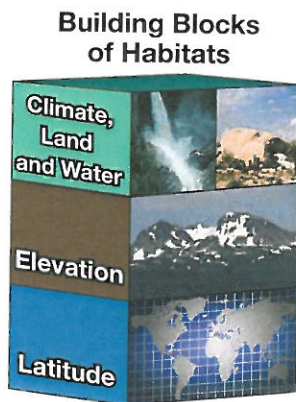
The layer of air around Earth is the **atmosphere**. Think of the atmosphere as a blanket of air. Even something as light as air still has weight and thickness (or density). Close to the ground, the blanket is thick—there is lots of air above it, pressing down—so it holds in more heat. High in the mountains, the blanket of air is thinner. More heat escapes, so it is colder.

Do You Know?

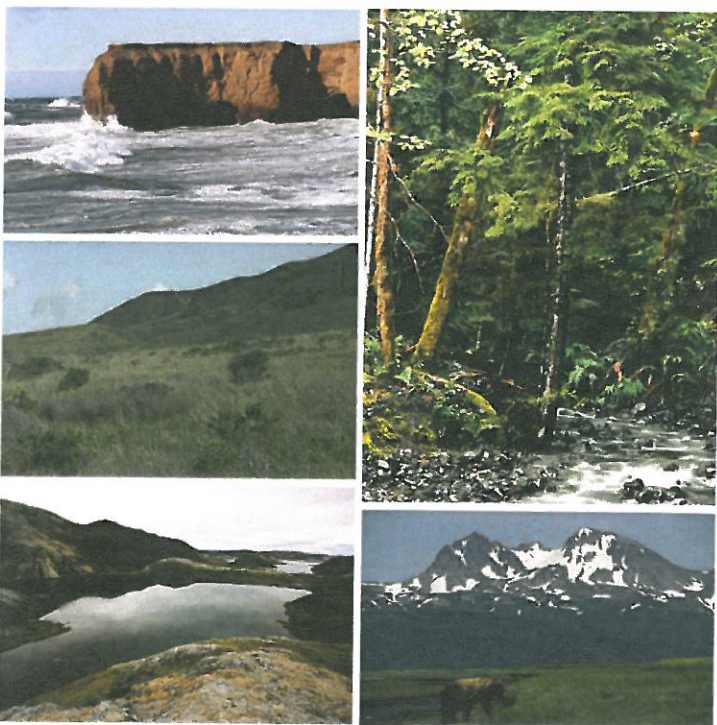
You might wonder why areas of high elevation aren’t warmer than areas of low elevation, since it seems as if they’re closer to the Sun. The Sun is incredibly far away—about 150 million kilometers (93 million miles) from Earth. The height of Mount Everest (8,848 meters or 29,028 feet) is a tiny fraction (about .00006) of the distance from Earth to the Sun. That’s too small to make a difference in the amount of sunlight it gets.



Because some areas are warmer than others, the differences in temperatures create wind. The wind carries moisture (water) between parts of the system. The combination of differences in temperature, wind, and moisture creates vastly different **climates** all over our planet. Climate is weather patterns over long periods of time—not just days, weeks, or months. Climate is half of the third building block of habitats.

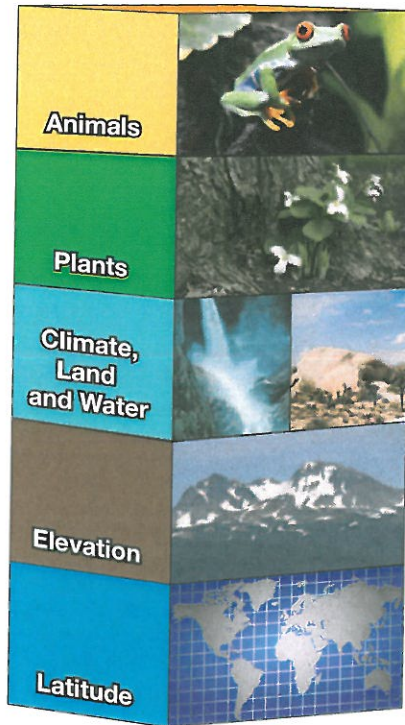


The other half of the third building block of habitats is land and water features. Almost three-fourths of Earth's surface is water, and almost all of that is in oceans. Earth's land, the other quarter of Earth's surface, is different from place to place. It may be flat, hilly, or mountainous. There may be big lakes, small streams, or very little surface water. Land and water features are as important as climate in building a habitat.



Earth has many different land and water features.

Building Blocks of Habitats



All these building blocks—latitude, elevation, climate, land and water—determine what types of plants can grow in a region. And because many animals eat plants to stay alive, the types of plants help determine what animals can live in a region. So plants and animals are the last two building blocks of habitats. All of these building blocks combine to create many different habitats on Earth.

Surviving in Habitats

A habitat meets the needs of the things that live there. Living things survive best in habitats in which all their needs are met. These needs include food, water, shelter, space, safety, and a place to have and raise **offspring**.

Plants and animals that depend on each other in a habitat, are **interdependent**. Plants provide animals with food and shelter. Animals help to spread the seeds of plants. And every part of a habitat is needed for the health of the system.



A swallow uses the hole in a tree for a nest.



A bee carries pollen from one flower to another.

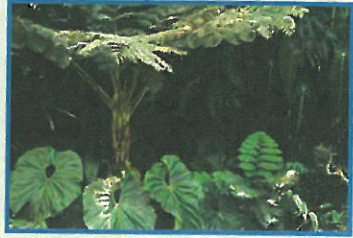
ADAPTATIONS

Behaviors



Flies are attracted to the giant carrion flower. It gives off a smell like rotting meat. The flies carry the flower's pollen to other flowers.

Body Parts



The bottom plant in this photo, which grows mostly in shade, has large leaves to soak up as much sunlight as possible.



Musk oxen stand in a close circle to protect their young.



A giant anteater has a long snout that helps it find and eat insects.

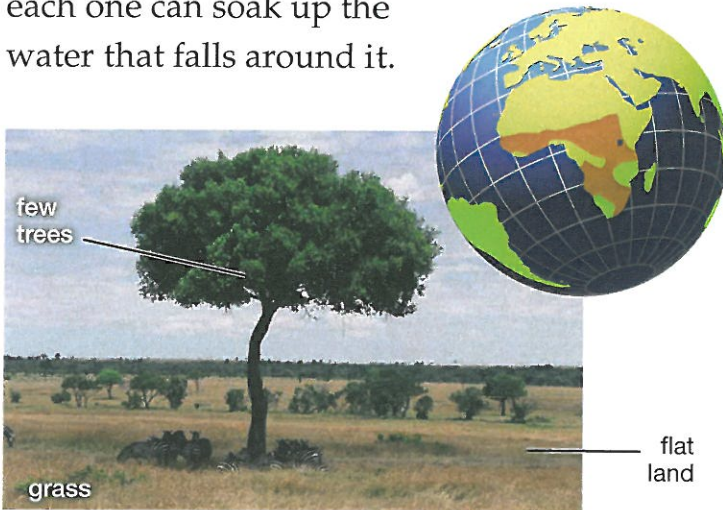
All living things have **adaptations** to survive in their habitat. Adaptations are behaviors and body parts that help a living thing survive. These adaptations have developed over a very long period of time in response to their specific habitat. They might not work well in different habitats.

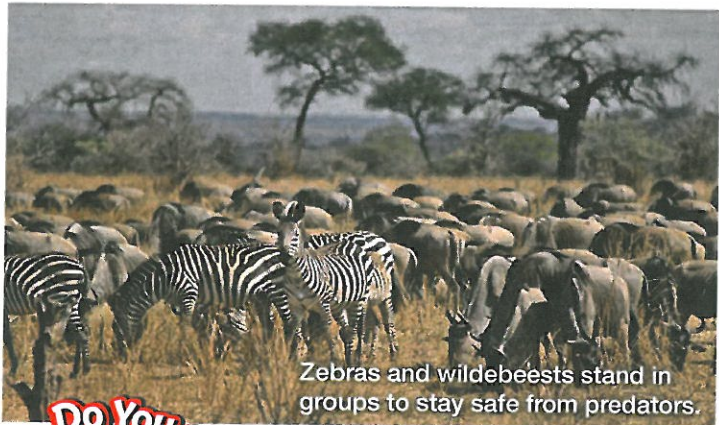
Three of Earth's Habitats

Earth's **environment** is made of living and non-living parts. The environment has many habitats. Let's look at habitats in three different latitudes. We'll start with an African savanna, which is a grassland habitat close to the equator at a low elevation. The climate on a savanna is hot. It's also dry during most of the year, but heavy rains fall during the summer.

Most of the land on a savanna is flat, and the main plants are grasses. Most types of trees cannot grow on a savanna because they would not get enough water. The few trees and shrubs are far apart so each one can soak up the water that falls around it.

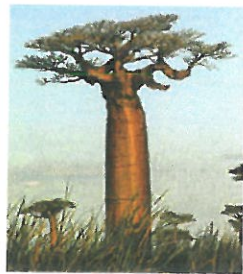
African Savanna





Do You Know?

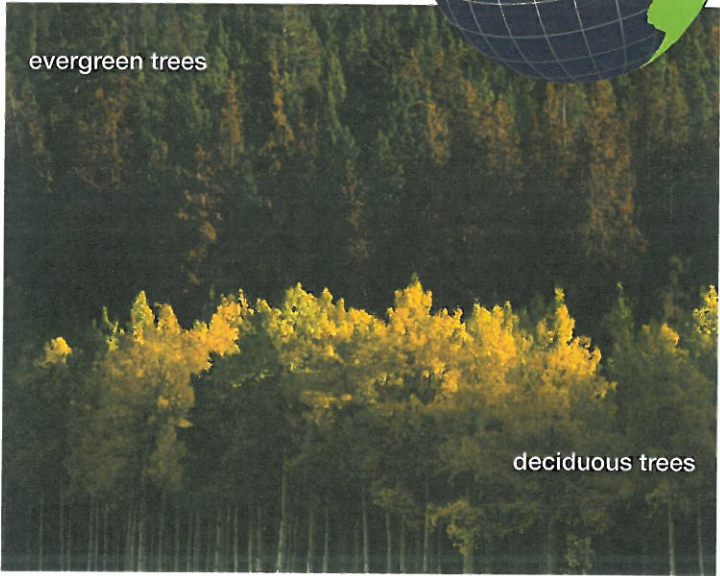
Baobab trees have adapted to the dry savanna habitat by storing water in their trunks. This water supply nourishes them during dry months.



Because the land is flat and few trees grow, animals on a savanna do not have many places to hide. Zebras and antelopes live in large groups to help them stay safe from lions and cheetahs. Meerkats live in burrows in the ground so they can hide from animals that want to eat them. Cheetahs use speed to catch their food. Lions cannot run long distances, so they use sight and hearing to find their prey, and they sneak up on them until they can spring from close-by.

Next, let's visit a temperate forest in a middle latitude. Because it is farther from the equator, this habitat has a cooler climate than a savanna. The weather changes more from season to season, and winters are cold. Many trees in this habitat lose their leaves in winter. Trees lose water through their leaves. So losing their leaves means trees keep more water. As the weather warms up again in spring, the trees grow new leaves.

Temperate Forest





This squirrel is saving food for the winter.



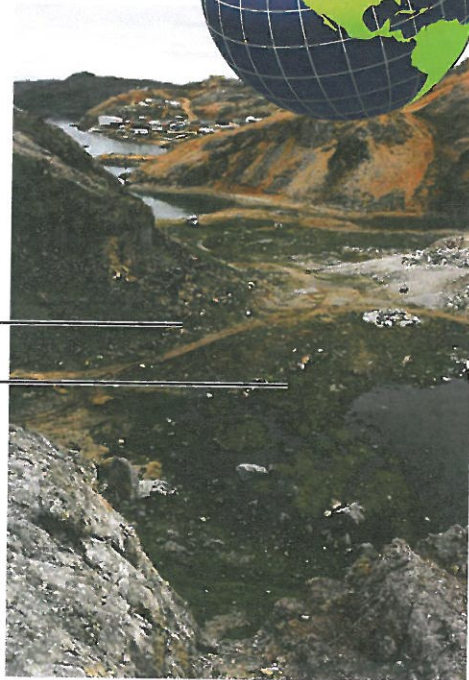
Some forests in middle latitudes are at higher elevations. Many evergreen trees grow in these forests. Evergreens usually have smaller leaves or needles, and stay green in winter. They are better adapted to living in cold climates, where water may be frozen in winter.

Animals in mid-latitude forests have special adaptations to survive the cold winters. Geese and many other birds **migrate** to warmer places to find food. Squirrels and chipmunks store food in the fall and eat it all winter. Bears eat extra food in the fall and **hibernate** in winter.

The last place we will visit is a polar habitat—the tundra in the far north of Canada, at a high latitude. This habitat has very cold weather. Snow and ice cover the land for much of the year, and winters are severe.

Plants grow in areas where the snow melts. Plants have adapted to this habitat by growing close to the ground to be safe from high winds. The tundra has very few trees because the ground is frozen, so deep roots cannot grow.

Tundra



no trees —————

low ground cover —————



As in the mid-latitude forests, many tundra animals leave during the coldest part of winter. The animals that stay in the tundra year-round have special adaptations to help them survive the cold. Moose and musk oxen have thick fur to keep them warm. Marine mammals, including seals, whales, and walrus, have blubber to keep them warm in icy water. Some small animals stay underground during the coldest times of the year.

Habitats Change

Many things can cause habitats to change over time. The things that live in a habitat can change it. Natural forces can change a habitat. And people change habitats.

Animals change habitats in many ways. For example, beavers build dams across streams. The dams cause the streams to flood, which creates new habitats for frogs, turtles, fish, ducks, and other animals. Another example of animals that change their habitat is earthworms. Earthworms dig tunnels in the soil, which allows air into the ground and helps plants to grow better. A third example is termites. Termites eat wood and other dead plants. They can damage forests and crops, but they can also put nutrients from the plants back into the soil.

WOWSER!

Termites live in colonies and build underground nests. A nest can grow so large that it turns into a mound above the ground. Mounds can be as large as 9 meters (30 ft.) high!





Lava burns everything in its path. But cooled lava rock is rich in nutrients, providing a great place for new plants to grow.

Natural events such as fires, floods, lightning strikes, extreme weather, and other forces change habitats, too. When a volcano erupts, lava and mud covers everything in its path. The volcano may destroy a habitat, but it also creates a new one. Lava from volcanoes created the Hawaiian Islands. A hurricane might wash away a sandbar off the coast, but then create new sandbars in a different place. Natural forces are always destroying parts of habitats and creating new ones.

People are a third factor that changes habitats all over the world. People cut down forests for wood and to create farmland. They dig minerals out of the ground in big mines, sometimes flattening a whole mountain. They build dams to store water in giant lakes. In some places, people build cities that cover land with concrete and structures. Building cities changes natural habitats into urban habitats.

You can change the habitat in your own backyard. Adding a pond, birdbath, or bird feeder attracts new animals. Planting a garden changes a backyard habitat, too, providing new sources of nutrition for local animals.



Do You Know?

When people move someplace, they often bring animals with them. Those animals can change the local habitat. For example, settlers to the Galapagos Islands brought with them cattle, goats, and other grazing animals. These animals ate the Galapagos tortoises' food supply. Rats had also stowed away on the settlers' ships. Rats eat tortoise eggs and hatchlings.



Clearcuts destroy animals' homes and cause erosion.

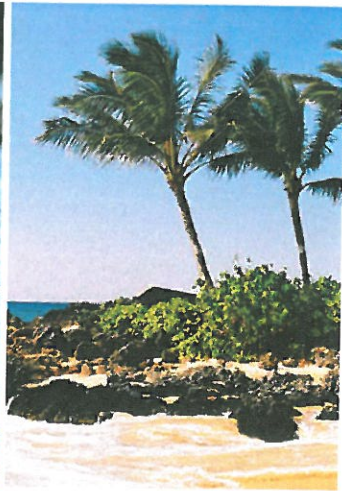
People can change the air and water of habitats by creating **pollution**. Some factories dump bad chemicals into the air or water. When people throw away batteries, phones, and many other things, toxic chemicals get into the soil. Rain carries these chemicals into the water supply.

Sometimes people cause **erosion** that threatens a habitat. When people cut down forests, the tree roots that held the soil together disappear, so rain washes the soil away. Farming and grazing animals can also destroy the plants that would naturally hold the soil together, leading to more erosion.

Conclusion

In this book, you have learned about the building blocks of habitats—latitude, elevation, climate, land, water, plants, and animals. You have also learned about the interdependence of the living things in a habitat. Now you know why the pictures on page 4 could not be real.

Each of Earth's habitats is a system, and all the parts of the system work together in balance with each other. Each habitat is a home for the plants and animals that live there. When the balance is upset, living things struggle to survive or may even disappear. What can you do to help the balance of Earth's habitats?



Glossary

adaptations	changes in an organism or species that allow it to survive better in its environment (p. 11)
atmosphere	a layer of gases surrounding a planet, star, or moon (p. 6)
climates	the weather conditions in an area over a long period of time (p. 7)
elevation	the height of land above sea level (p. 6)
environment	all the living and non-living parts of Earth (p. 12)
erosion	the gradual wearing away of rock or soil by water, wind, or ice (p. 21)
habitat	the place in which a plant or animal lives and receives what it needs to survive (p. 4)
hibernate	to go into a state of deep sleep, often during winter (p. 15)

interdependent	relying on each other (p. 10)
latitude	a measure of how far a place is from the equator (p. 5)
migrate	to move from one habitat or region to another at a certain time each year (p. 15)
offspring	an animal's young (p. 10)
pollution	harmful material in the air, in water, or on the ground (p. 21)
survive	to stay alive; to continue to exist (p. 4)

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KEY ELEMENTS USED IN THIS BOOK

The Big Idea: Plants and animals, including humans, each live in a habitat. When a habitat changes, the organisms that live within it must either adapt or move out of it in order to survive. Only those organisms that successfully adapt will survive and pass their genes to future generations within the habitat. Human activity can have considerable effects on natural habitats. Taking action to protect a habitat from harmful changes could provide a healthy and sustainable environment for many species in the future.

Key words: adaptation, atmosphere, building block, climate, elevation, environment, equator, erosion, habitat, hibernate, interdependent, latitude, marine, migrate, moisture, mountainous, offspring, polar, pollution, savanna, shelter, survive, temperate forest, toxic, tundra, urban, weather

Key comprehension skills: Compare and contrast

Other suitable comprehension skills: Cause and effect; classify information; main idea and details; identify facts; elements of a genre; interpret graphs, charts, and diagrams

Key reading strategy: Ask and answer questions

Other suitable reading strategies: Connect to prior knowledge; summarize; visualize; using a table of contents and headings; using a glossary and bold terms

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