ESSENTIAL **QUESTION**

What Are Some Adaptations to Life in Water?

Engage Your Brain

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

Can you spot the sea horse? Pygmy sea horses are adapted to blend with their brightly colored habitat. Where would you find a pygmy sea horse like this one?

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ACTIVE **READING**

Lesson Vocabulary

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

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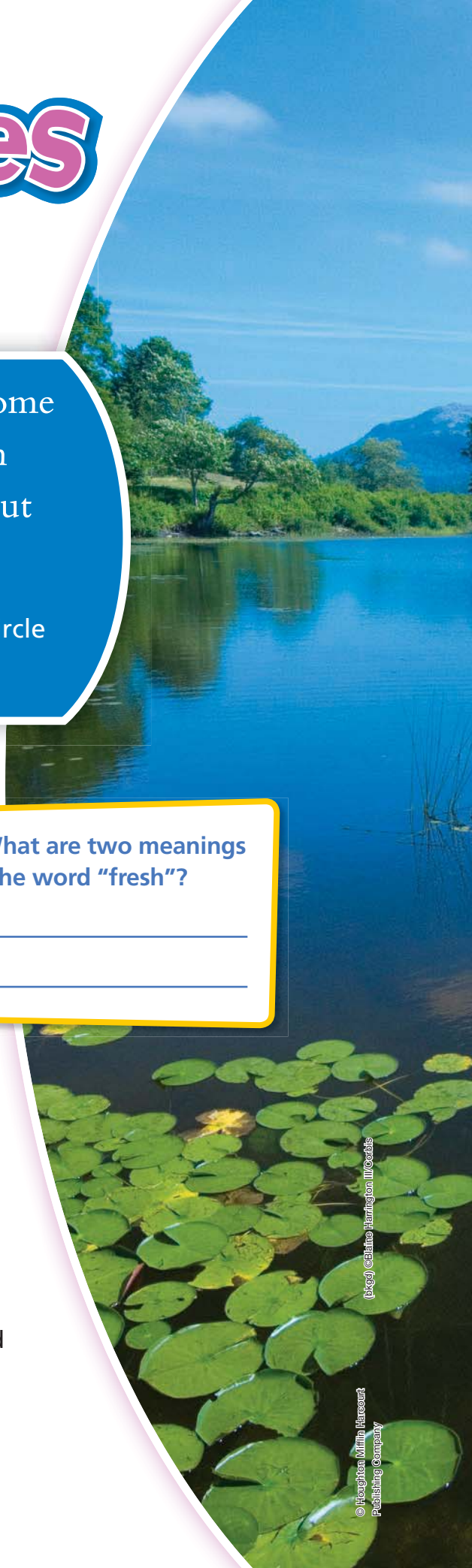
Problem-Solution

You can think of differences in habitats as problems, or challenges. You can think of adaptations as solutions to these problems. Active readers keep track of problems and solutions as they read. This helps them stay focused on the way information is organized.

Life in Lakes and Ponds

There are many kinds of water habitats. Some are salty and some are not. Water found on Earth that is not salty is called *fresh water*, but ocean water is just as "fresh."

ACTIVE READING As you read the text below, circle the descriptions of the three zones of a lake.



Ponds and lakes are examples of freshwater habitats. Lakes and ponds are wide bodies of water that do not flow very much. These habitats are divided into zones. The zone close to the shore has many living things in it. Many kinds of water plants grow near the shore. Their roots grow in the soil at the bottom, but the water is shallow enough that their leaves get plenty of sunlight. Other plants, such as water lilies and water hyacinth, float near the shore. Many animals, including ducks, snails, and fish, eat water plants.

Further away from the shore is the open-water zone. Floating plants and plantlike organisms called algae can grow here. But the water is usually too deep for non-floating plants to reach light. The deep part of a lake or pond, where light does not reach, is called the deep-water zone. No plants can grow here. Catfish, worms, and bacteria are found in the deep-water zone. They feed on dead plants and animals that fall down from above.

▶ **What are two meanings for the word "fresh"?**

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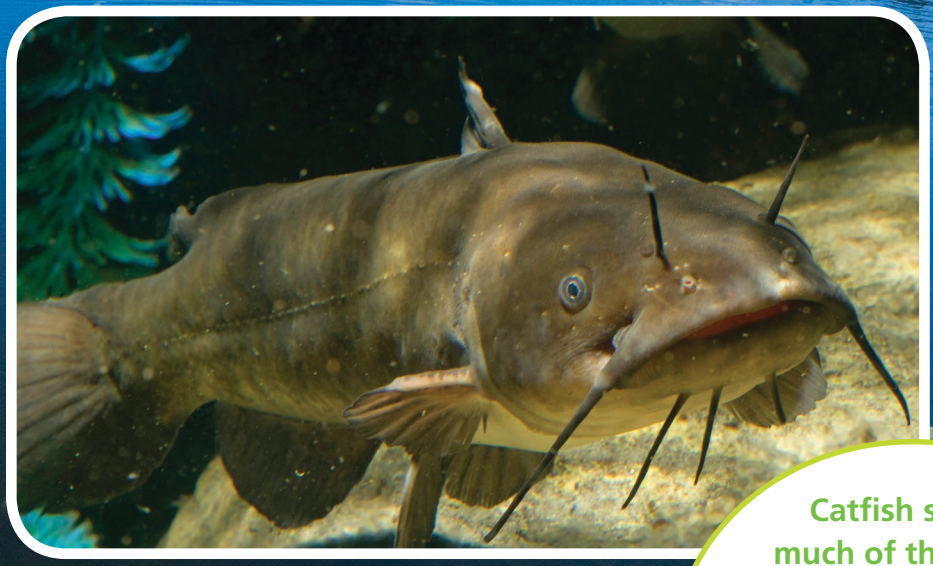
A snapping turtle has webbed feet that help it swim through the water.

Water lilies have air-filled pockets in their leaves. This helps them float on the surface of the water.



Catfish spend much of their time in the dark near the bottom of a pond or lake. Their whiskers are adapted to sense chemicals, which helps catfish find food in the dark.

▶ Which living thing shown on this page has an adaptation that helps it find food in the dark?

_____

Go with the Flow

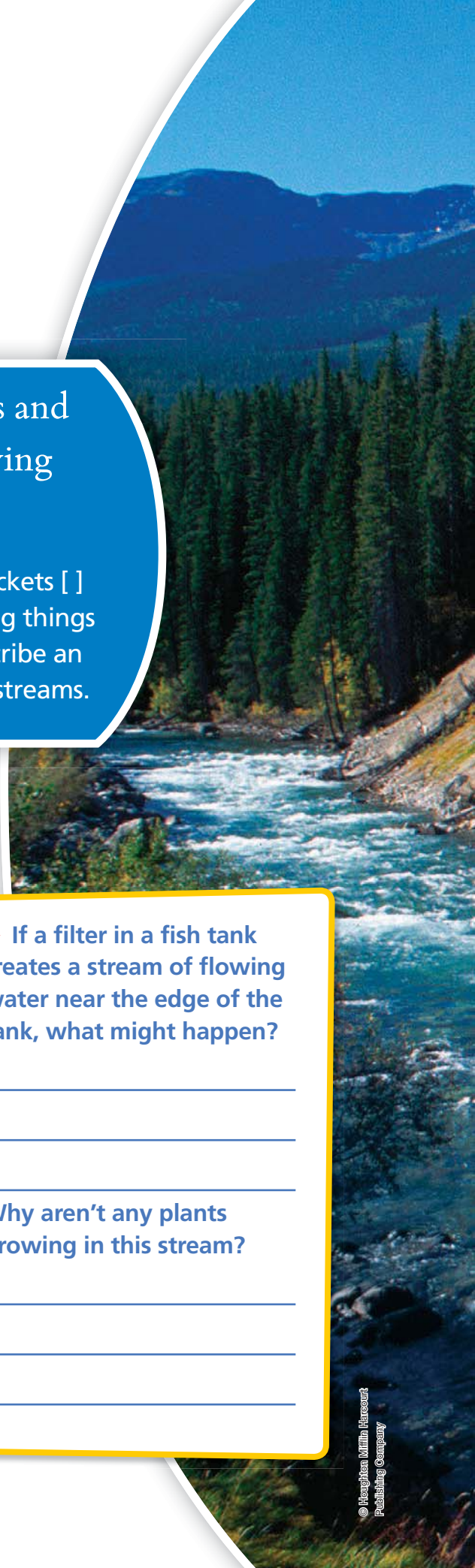
Unlike lakes and ponds, the water in rivers and streams is always on the move. How do living things keep from being washed away?

ACTIVE READING As you read this page, put brackets [ ] around the sentences that describe a challenge for living things in rivers and streams. Underline the sentences that describe an adaptation that living things have for life in rivers and streams.

The kind of living things found in a river or stream depends on how fast the water is moving. The faster the water moves, the harder it is for living things to make a home. Because of this, fast-moving streams are often clear. Very few plants and animals live there.

In places where the water slows down, more living things will be found. Many plants can grow near the banks of rivers and streams. Tiny plants called mosses make a fuzzy green carpet on rocks in and around rivers and streams. Mosses have hair-like structures that cling to rocks. This keeps them in place. Insects also live in flowing water. They can often be found floating on the surface, clinging to plants, or living under rocks in shallow water.

Of course, many fish are also found in rivers and streams. Fish must constantly swim upstream so that they are not carried away by the current.



▶ **If a filter in a fish tank creates a stream of flowing water near the edge of the tank, what might happen?**

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Why aren't any plants growing in this stream?

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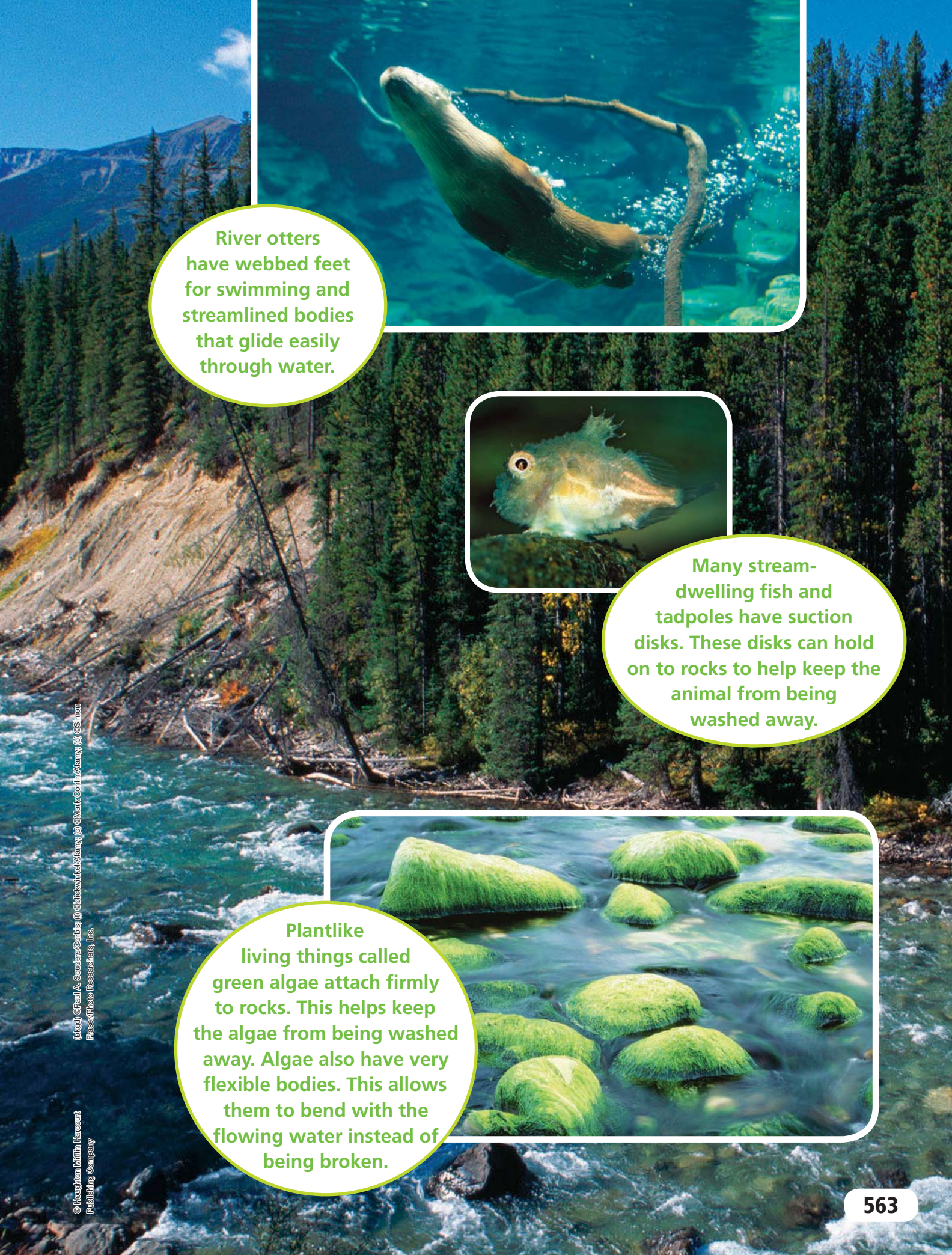

River otters have webbed feet for swimming and streamlined bodies that glide easily through water.

Many stream-dwelling fish and tadpoles have suction disks. These disks can hold on to rocks to help keep the animal from being washed away.

Plantlike living things called green algae attach firmly to rocks. This helps keep the algae from being washed away. Algae also have very flexible bodies. This allows them to bend with the flowing water instead of being broken.

Soggy Bogs

What do a bog beast and a swamp creature have in common? These imaginary creatures are adapted to live in muddy, wet habitats.

ACTIVE READING Underline the phrases that explain why wetlands are important habitats.

A **wetland** is an area of land covered by a shallow layer of water for most of the year. Bogs, swamps, and marshes are three types of wetlands. Bogs tend to be covered in a layer of thick mud. Swamps, like the one shown here, are forested wetlands. The trees often have roots both above and below the water. *Marshes* are wetlands without trees. Grasses and reeds are common marsh plants. Wetland plants have special tissues that carry air from the plant's leaves to its roots. Marshes on ocean coasts are covered with salt water. Plants here also have adaptations to get rid of excess salt.

Wetlands are very important habitats. Many kinds of birds make their nests in wetlands. Migrating water birds use shore wetlands as rest areas on their journeys to spend winter in warmer habitats. Wetlands are also home to many different kinds of plants and animals, such as carnivorous plants, insects, fish, snakes, alligators, frogs, and even giant water rodents!

▶ **Circle the two birds' feet that are best adapted for living in a wetland.**

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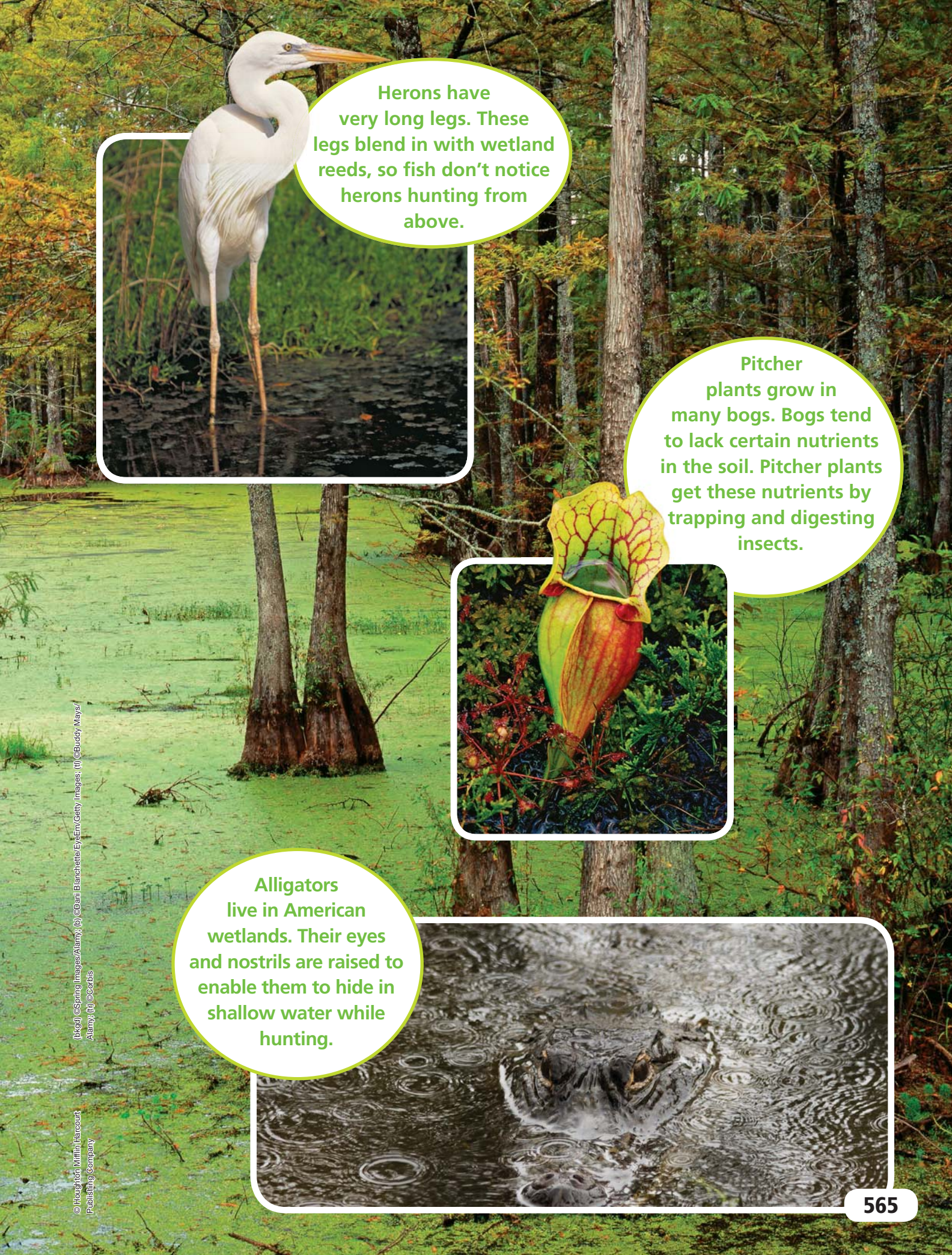


Herons have very long legs. These legs blend in with wetland reeds, so fish don't notice herons hunting from above.

Pitcher plants grow in many bogs. Bogs tend to lack certain nutrients in the soil. Pitcher plants get these nutrients by trapping and digesting insects.

Alligators live in American wetlands. Their eyes and nostrils are raised to enable them to hide in shallow water while hunting.

Between a Rock and a Hard Wave

One of the harshest habitats on Earth is found on the edge of the ocean along coastlines.

ACTIVE READING As you read this page, underline challenges faced by living things in the intertidal zone. Circle adaptations for living in the intertidal zone.

The place where the ocean meets the coast is called the **intertidal zone**. Every day the tide comes in and covers the intertidal zone in salt water. Then the tide goes out and the intertidal zone is exposed to air and bright sunlight. Between high tide and low tide, the intertidal zone is constantly bashed by waves. Living things in the intertidal zone have adaptations that protect their bodies from being crushed, washed away, or dried out. Seaweed, sea stars and sea urchins, barnacles, clams and oysters, tube worms, and anemones [uh•**NEM**•uh•neez] call the intertidal zone home.

▶ **Put an *H* next to what the sea anemone and clam look like during high tide. Put an *L* next to what they look like during low tide.**

Sea stars have structures on their arms that act like suction cups. This helps sea stars anchor themselves to rocks so they don't get washed away when waves batter the shore.

Serpulas are marine worms. They live in hard tubes that protect their fragile bodies. When the tide is out, the worms retreat into the tubes.

Seaweeds have strong, flexible bodies that can endure constant waves. They attach to rocks to keep from being washed away. Many have air pockets that help the tops of the seaweed float and stay in the sunlight when the tide is in.

Out to Sea

The ocean is the largest habitat on Earth! Life can be found all the way from its edges down to its deepest depths.

ACTIVE READING Read the text below and circle the names of the two major zones of the ocean.

Coral reefs are found near many coasts. They are filled with a great diversity of sea life.

Like lakes, the ocean can be divided into zones. Light reaches the top zone, known as the photic [FOH•tik] zone. Close to shore, corals and seaweeds live. Colorful fish and pygmy sea horses blend with brightly colored coral reefs. In the open ocean, floating seaweed and tiny plantlike organisms use the sun to make food. The photic zone is also full of animal life, including jellyfish, squid, fish and sharks, dolphins, and whales.

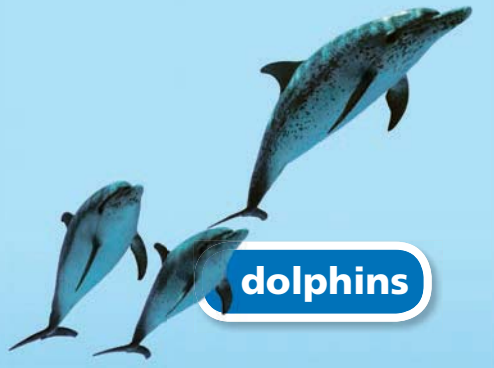
Underneath the sunlit zone is the part of the ocean where light does not reach. This part is called the aphotic [ay•FOH•tik] zone. It is very dark and very cold. Some animals move back and forth between the photic and aphotic zones.

The ocean floor is covered with mountains, valleys, and canyons, much like on land. There are undersea volcanoes and hot springs called vents. Hot water full of minerals shoots out of these deep-sea vents. Many living things depend on the heat and use the minerals to make food. Animals living here are very different from other ocean animals. Their bodies are adapted to living under extreme water pressure. Most cannot

▶ Match each zone with its description.

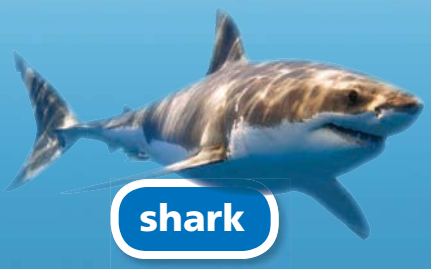
APHOTIC ZONE	Seaweeds and corals live here.
DEEP OCEAN FLOOR	Mid-ocean level where no light reaches.
PHOTIC ZONE	Animals that glow are found here.

Large floating mats of a seaweed called sargassum provide a safe habitat for many animals, including young sea turtles.



dolphins

Jellyfish float in the open ocean, catching fish that accidentally wander into their tentacles.



shark

Some marine tube worms live near the hot vents at the bottom of the ocean. They filter tiny organisms out of the water for food.

Deep-sea fish live in total darkness. Some have adaptations that allow them to produce light. They use this light to lure food or find mates.

Oceans in Peril

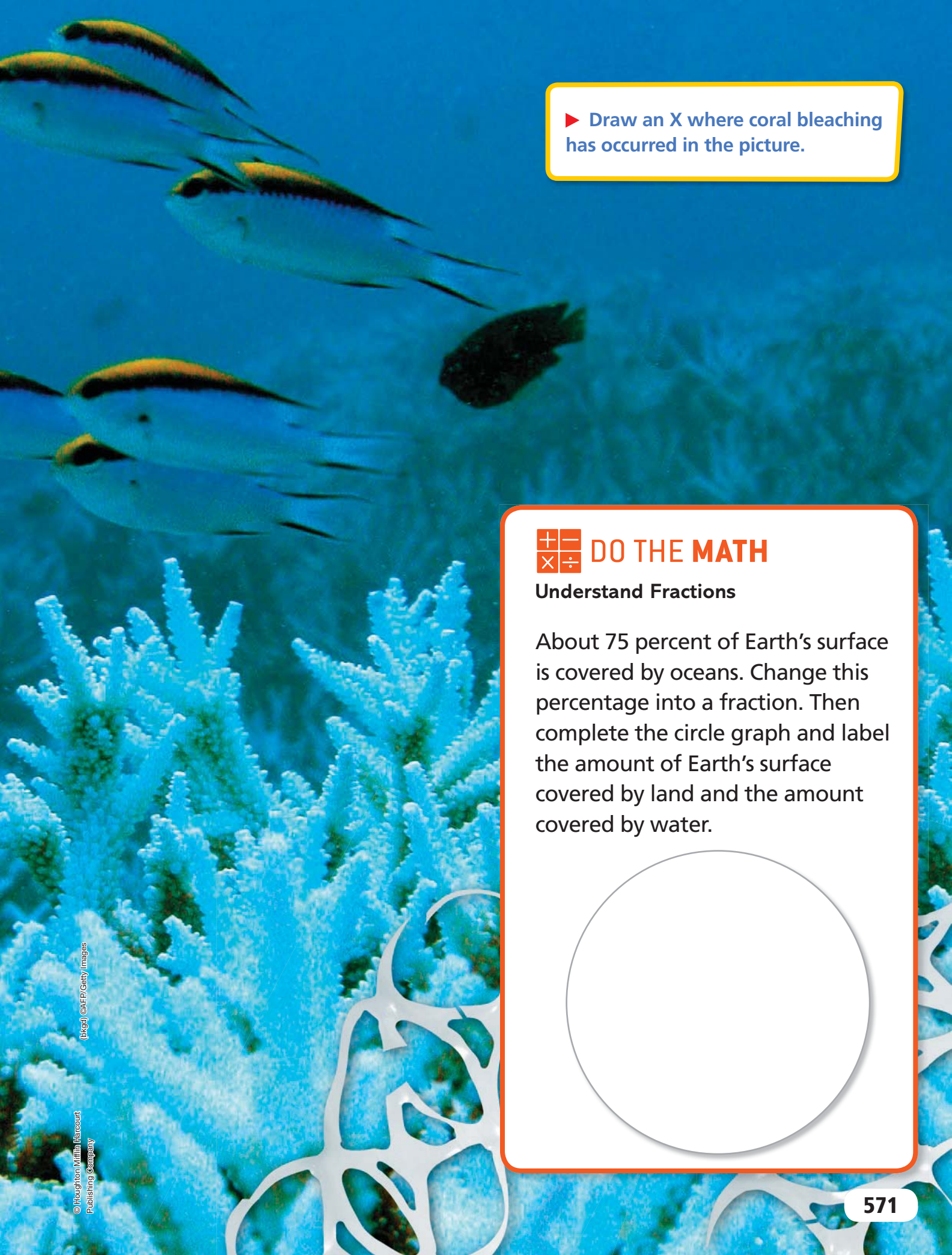
Most living things are very well adapted to their habitats. When their habitats change, living things can be put in danger.

ACTIVE **READING** As you read this page, find and underline three problems sea life faces.

Today, many changes are taking place in ocean habitats. Large areas of coral reef are losing their color, a process called *coral bleaching*. Many bleached patches are dying. Possible reasons for coral bleaching include rising water temperatures and ocean pollution.

People take too many fish out of the sea. Animals that depend on these fish for food do not have enough to eat. The fish that are left cannot reproduce fast enough to rebuild their population. It is possible that the fish we and many other animals depend on for food could become extinct.

Some countries dump their garbage in the ocean. This harms sea life. Chemicals from the trash are harmful. Living things in the ocean easily get caught in trash, such as the plastic rings used to package drink cans. Recently, a giant patch of garbage has been discovered floating in the middle of the ocean. Ocean currents have brought garbage from many countries to one area, and now the Great Pacific Garbage Patch is about twice the size of the state of Texas!



▶ Draw an X where coral bleaching has occurred in the picture.

DO THE **MATH**

Understand Fractions

About 75 percent of Earth's surface is covered by oceans. Change this percentage into a fraction. Then complete the circle graph and label the amount of Earth's surface covered by land and the amount covered by water.