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SPIDERS!

Desert Cactus 10

Extreme Life 16

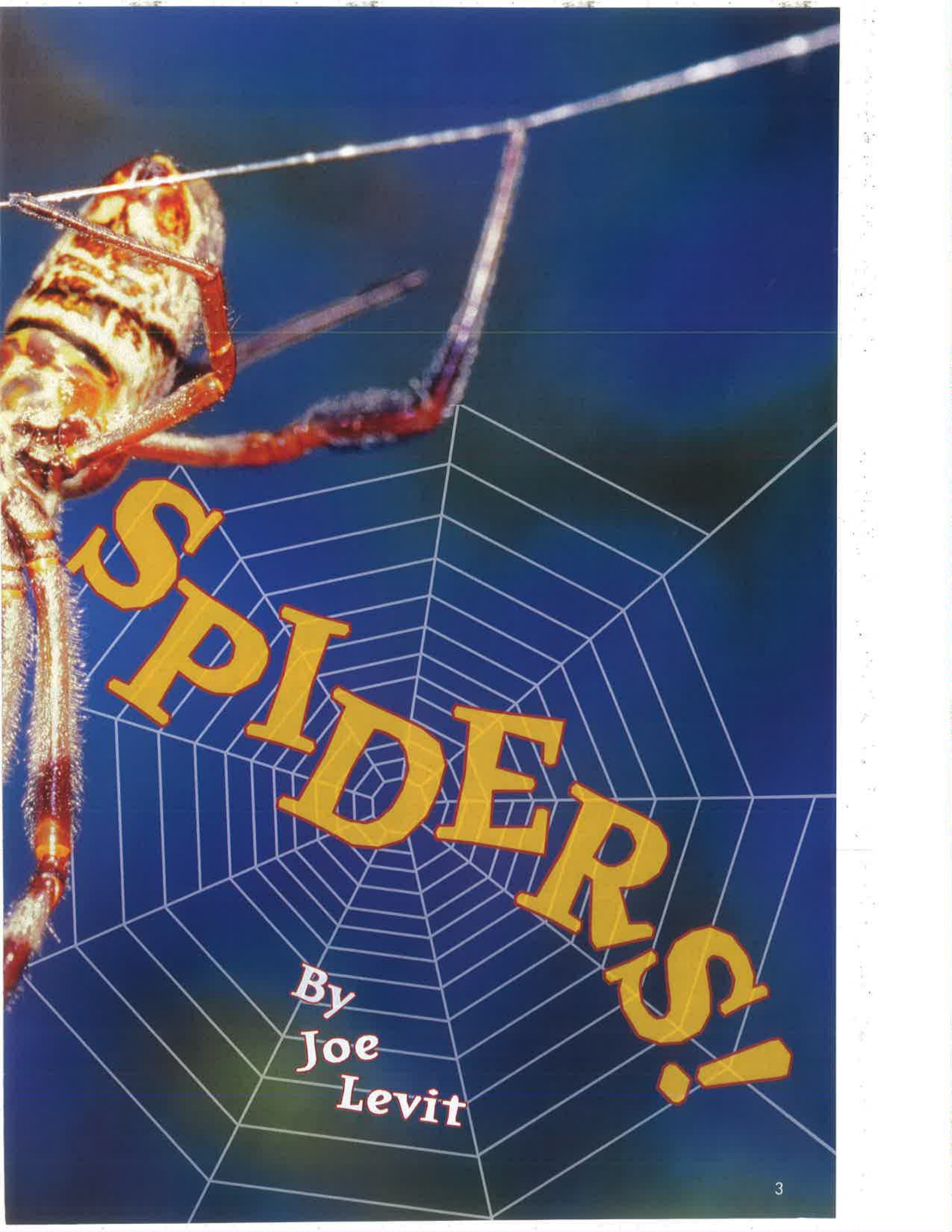


Life Science

COMPREHENSION STRATEGY:

As you read, look for main ideas. Then look for details that support them.





S P I D E R S !

By
Joe
Levit

In the moonlight, a bolas spider spins a line of silk. At the end of the silk is a sticky blob. This is her fishing line. She is hunting for her supper.

The bolas spider then gives off a smell. Soon a male moth is drawn to that smell. He flies past the spider. She is ready for him. She swings her fishing line back and forth. She is hoping to catch him for dinner.

The moth zooms past unharmed. She swings her line again. This time, the sticky blob catches him. She reels in her first meal of the night.

Spider Supper

The bolas spider is a **predator**. Almost all spiders are. A predator hunts other creatures to survive. Spiders are great hunters, but they can't chew or swallow. Yet eating the moth won't be a problem. Here's why.

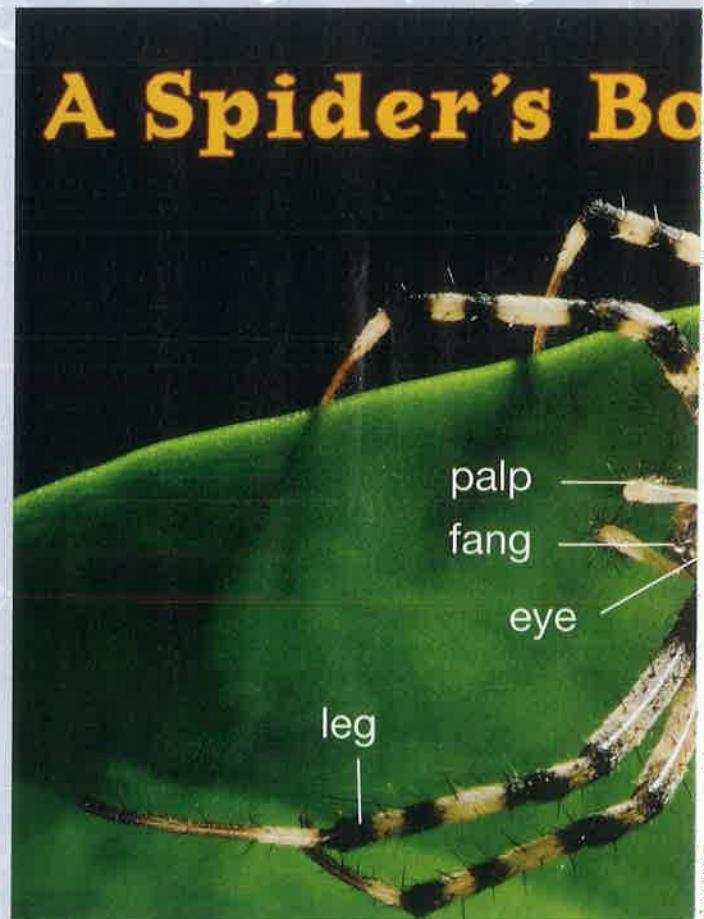
A spider's mouth is double trouble for **prey**. Most spiders have fangs and palps. Palps are limbs near the mouth. The bolas spider's palps hold her prey. She gives the moth a deadly bite.

Her fangs release a poison. It kills the moth. Then she injects juices that make his insides soupy. Now she's ready to suck up her supper.

Looking for Prey

To catch prey, spiders first have to find it. Most spiders have eight eyes. Yet only a few kinds of spiders see well. Most see only if a shape is moving or still. So spiders must use other senses like hearing to help them hunt.

Spiders don't have ears, but they can "hear." Hairs on their legs and bodies pick up sound vibrations. These hairs connect to nerves. The nerves send signals to the brain. The signals tell spiders when prey is near. They let a spider "hear" a bug crawling or a fly buzzing.

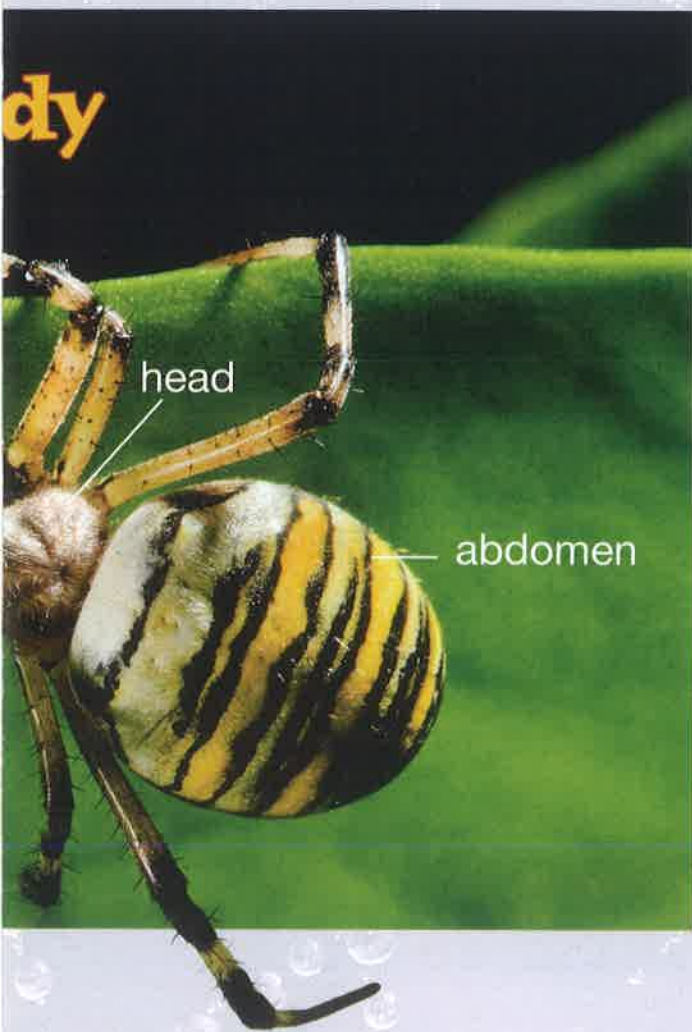


Family Ties

Scientists know of about 40,000 kinds of spiders. Spiders live in forests, seashores, and deserts. They live under rocks, in water, and on plants.

All these spiders may bug you. Don't confuse them with insects, though. Spiders are **arachnids**.

Arachnids have eight legs. They have two main body parts. The head, stomach, and poison glands form the upper part. The heart, lungs, and silk glands are in the lower part, or abdomen. A hard **exoskeleton** protects their bodies.



Arachnid or Insect?

People sometimes think that spiders are insects. They are not. See how they are different.

Body Shape



Spider: 2 parts



Insect: 3 parts

Legs



Spider: 8



Insect: 6

Eyes



Spider: Up to 8 individual eyes



Insect: 2 compound eyes (made up of many tiny lenses)

Wings



Spider: 0



Insect: 0-4

Woven Wonder

All spiders make silk. They use it to build webs, traps, and egg sacs.

The silk comes from tubes at the end of a spider's body. These tubes are called spinnerets. Each tube shoots a strand of silk. It is liquid at first. Then the silk hardens in the air. The strands form a thread. Each thread is thinner than a hair but stronger than steel.

close-up of a spider making silk



Made to Order

Spiders spin different kinds of silk. One kind is for catching prey. It's sticky and stretchy. Another is for making egg sacs. It keeps the eggs safe. A third is used to line the inside of nests. The fourth is for a dragline.

Spiders use draglines two ways. They spin long, straight draglines to support webs. Spiders also use them to travel. To do this, a spider stands on a leaf. It waits for a breeze to catch its dragline. The breeze blows the dragline and the spider to a new spot.

Spinning a web might take an orb weaver all night.



Building a Web

All webs are made of silk. Yet not all webs look alike. For example, an orb web looks like a bicycle wheel. Strong draglines make up the spokes. Sticky threads are in the center. The orb weaver sits on its web, waiting.

Insects crash into the web. They stick to it. When this happens, the spider feels the web vibrate. Then it dashes out to catch the prey.

Orb webs are strong, but insects damage them. So, many orb weavers build new webs every day.



This spider makes a net from silk. It throws the net on passing insects to trap them.

Funnels and Nets

Not all spiders spin orb webs. Some make a web shaped like a funnel. It is wide and flat on top. In the center is a dark tunnel. That's where the spider hides. When an insect lands on the web, the spider rushes out to strike.

Other spiders weave a sheet of web between blades of grass. A tangle of silk threads hangs above it. Insects crash into the threads. They fall on top of the web, where the spider waits.

A net-casting spider hangs upside down. It makes a small web between four of its legs. It throws out its web at insects that fly by. Then the spider pulls up the net and prey.



Without Webs

Some spiders don't make webs. Yet these spiders still use silk to help them hunt. For example, a jumping spider uses a dragline. When it leaps to attack prey, the dragline keeps it from falling. If the spider misses its prey, it can pull itself back to safety.

The water spider spins a silk pocket. It attaches the pocket to an underwater plant. The spider fills the pocket with air bubbles. Then it climbs inside this underwater house. The spider sticks out its legs. When something tasty swims by, the spider attacks. It drags its meal inside the air pocket to eat it.

Knock, Knock

A trapdoor spider digs a nest in the ground. It builds a door from silk, leaves, and dirt. When an insect comes near, the spider throws open the door and catches the prey.

Tarantulas spin trip wires. Prey don't really trip over the thin lines of silk. Instead, their feet jerk the trip wires, and the tarantula dashes out.

Spiders are also prey. Bats, birds, and fish eat spiders. Sometimes spiders will eat other spiders.

Take the pirate spider, for example. It plucks at other spiders' webs. When the web owner comes out to see what happened, the pirate spider attacks.



No, it's not flying. This jumping spider is in the middle of a leap.

Living With Spiders

Many people think spiders are scary. Maybe it's their eight eyes or hairy legs. Yet spiders help us. Many of the insects they eat are pests.

Without spiders, we'd have more pests. So the next time you see a spider, don't be scared. Think about how they help balance life on Earth.

Wordwise

arachnid: an animal with eight legs and a body divided into two parts

exoskeleton: an animal's hard outside covering, such as a shell

predator: an animal that kills and eats other animals

prey: an animal eaten by other animals



Half in and half out of its air pocket, this water spider waits for prey to swim beneath its legs.



This flame-knee tarantula crawls over some dead wood in its hunt for prey.

Life Science

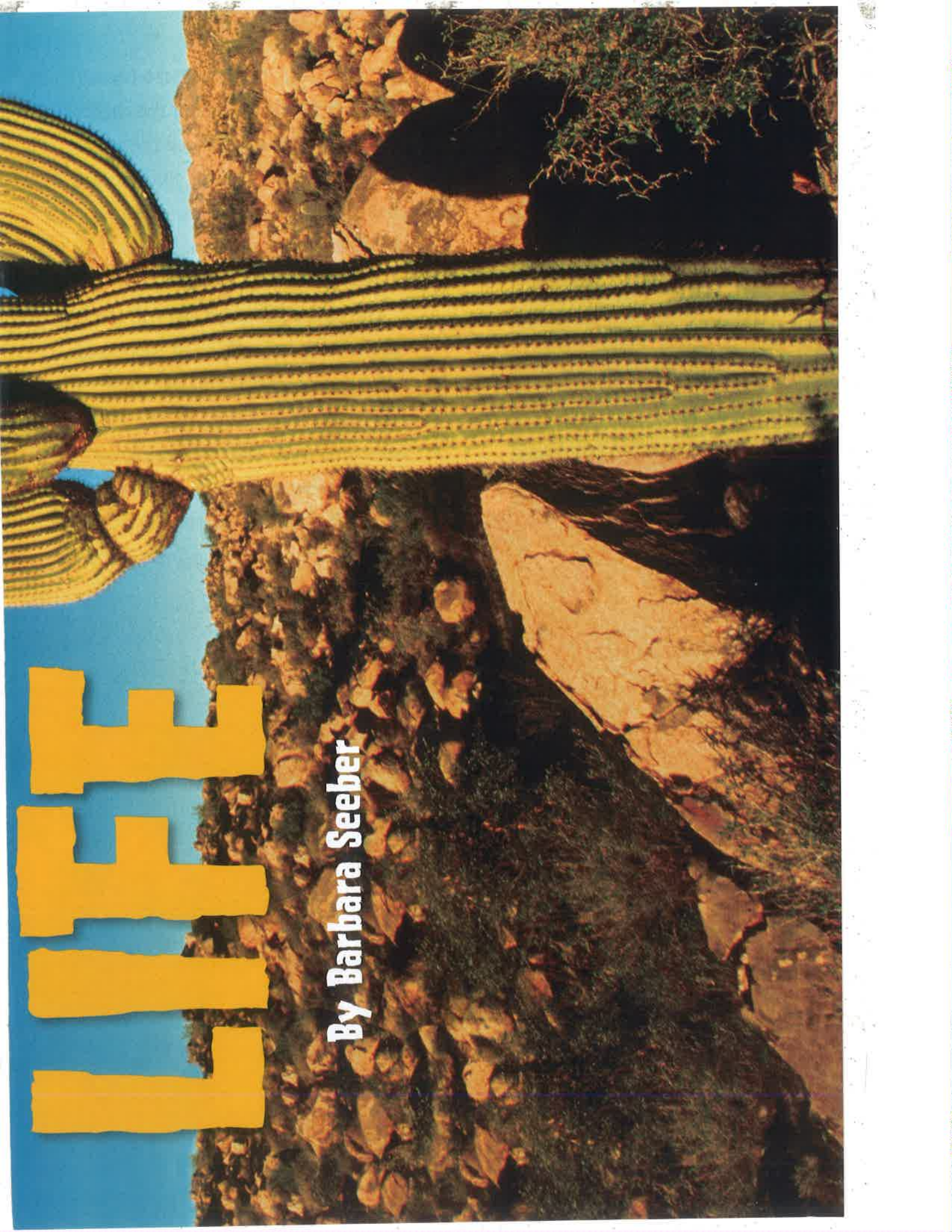
COMPREHENSION STRATEGY:

Summarize each section by retelling the information. Then summarize the entire article by telling the main idea of each section.

In the Sonoran Desert,
a mighty cactus is the

CENTER OF





LIFE

By Barbara Seeber

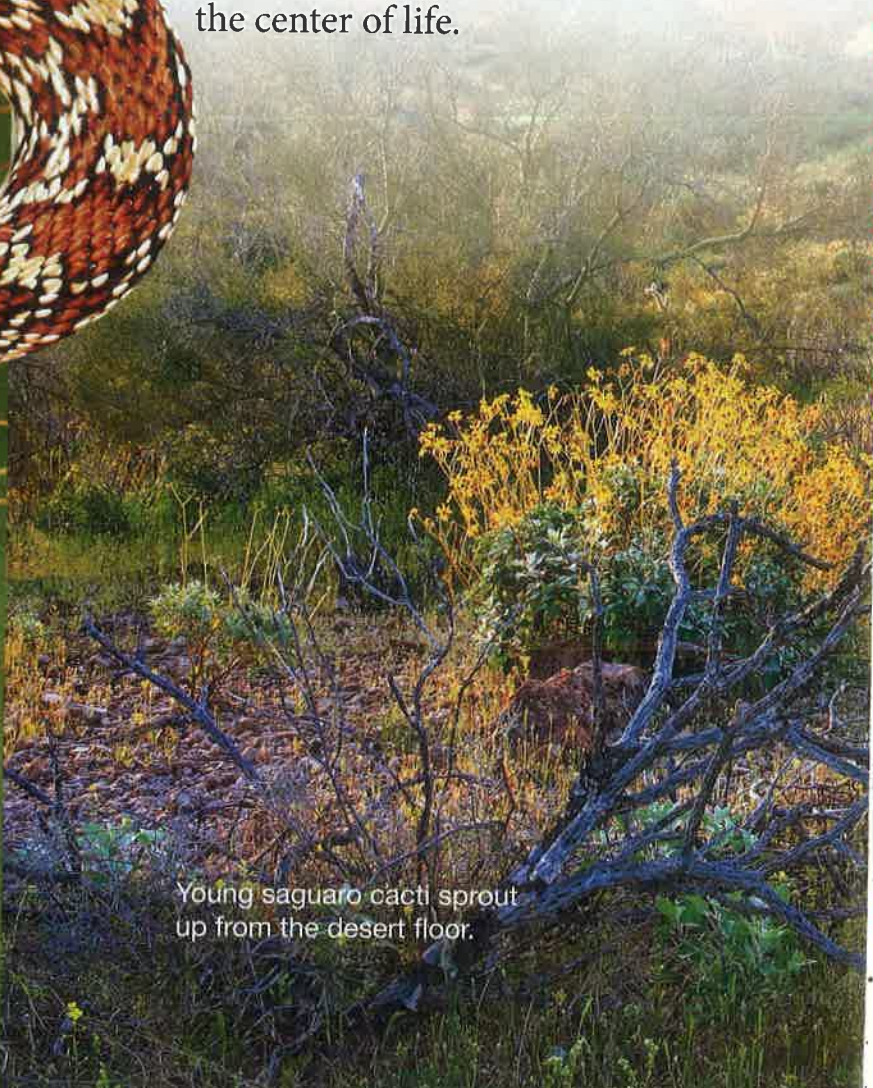


A gopher snake slithers along the spines of a saguaro.

A snake slithers up a saguaro cactus. A gray bird sits on one of the cactus's arms. The bird doesn't see the snake. The snake moves closer. Suddenly, it strikes. With a flutter and a flap, the bird flies off. The snake has missed its meal.

The bird will return. So will the snake. Both animals need this cactus.

A saguaro cactus can live for about 150 years. Throughout its life, animals will come to it. They will use it for food, shelter, and water. Birds will nest in it. Animals will eat its fruit. In the hot, dry desert, a saguaro cactus is the center of life.



Young saguaro cacti sprout up from the desert floor.

Skin Deep

The saguaro doesn't start out this way. During its first 10 years, it hardly grows at all. That's because a desert is hot and dry.

Not many kinds of plants grow in a desert **ecosystem**. Luckily, the cactus has **adaptations** that help it survive. It's built to live in the desert.

One adaptation is its skin. The skin is thick and waxy. It traps and holds water, so the cactus won't dry up.

Rows of sharp spines are another adaptation. They line the stem and protect the water inside. They keep animals from taking juicy bites.

Down to the Roots

The saguaro's roots also help it survive. They hold the cactus in the ground. They soak up water, too.

The roots don't grow deep. That's a good thing when it rains. As soon as water soaks into the ground, the roots slurp it up.

The cactus stores water in its stem. During rainstorms, the cactus sucks up as much water as it can. The stem gets fatter.

On hot, dry days, the saguaro takes water from its stem. You can tell when its water supply is low. The saguaro gets skinny.



Good to Grow

A saguaro makes its own food. At night, tiny holes on its stem open. Carbon dioxide (CO₂), a gas in air, flows into the holes.

During the day, the cactus takes in energy from the sun. That energy, the water, and the CO₂ mix together. That makes plant food. This process is called **photosynthesis**.

An elf owl peeks out from its nest inside a saguaro.



Late Bloomer

The cactus uses food and water to make flowers. Its white flowers open at night. Bats and doves come to sip the nectar. They have to work fast.

The flowers close during the day.

In late June, the flowers dry up. Fat fruit grow in their place. The fruit look like spiky red crowns. They split open under the sizzling sun. Insects and birds feed on the sweet pulp.

Some fruit fall to the ground.

Javelinas, which look like hogs, come to eat the fruit. Their strong jaws and tusks tear into the pulp.

After the javelinas, other animals come. For example, squirrels and rats eat the leftovers. Then mice and rabbits gobble up the black seeds.

Home Sweet Home

Not all animals eat the saguaro. Some live in it. A mother Gila woodpecker makes her home in it. *Tap, tap, tap.* She pecks a deep hole in the skin. The dark hole makes a cool nesting place.

She lays her eggs and raises her chicks here. Soon the chicks are able to fly. The birds move on.

An elf owl might move in next. It may stay for years. The hole is safe. From here, the little owl can spot prey.

Branching Out

In time, the saguaro is full of life. Branches grow out from its sides. Hawks nest in the crook of these arms. Animals eat the plants growing in the saguaro's shade. A bobcat sits on top. Up here, it can watch for predators like coyotes.

For 150 years, the cactus is a good **habitat**. Then old age and disease weaken it. One rainy night, a bolt of lightning strikes it. With a crash, it falls to the ground.

Yet animals still visit. Scorpions creep into it. Rattlesnakes slither around it. A jackrabbit sips at a root filled with water.

The saguaro will soon rot away. Yet other saguaros still grow nearby. Life in the desert goes on.

Join National Geographic for BioBlitz 2011 in Saguaro National Park. To learn more, go to nationalgeographic.com/bioblitz

Wordwise

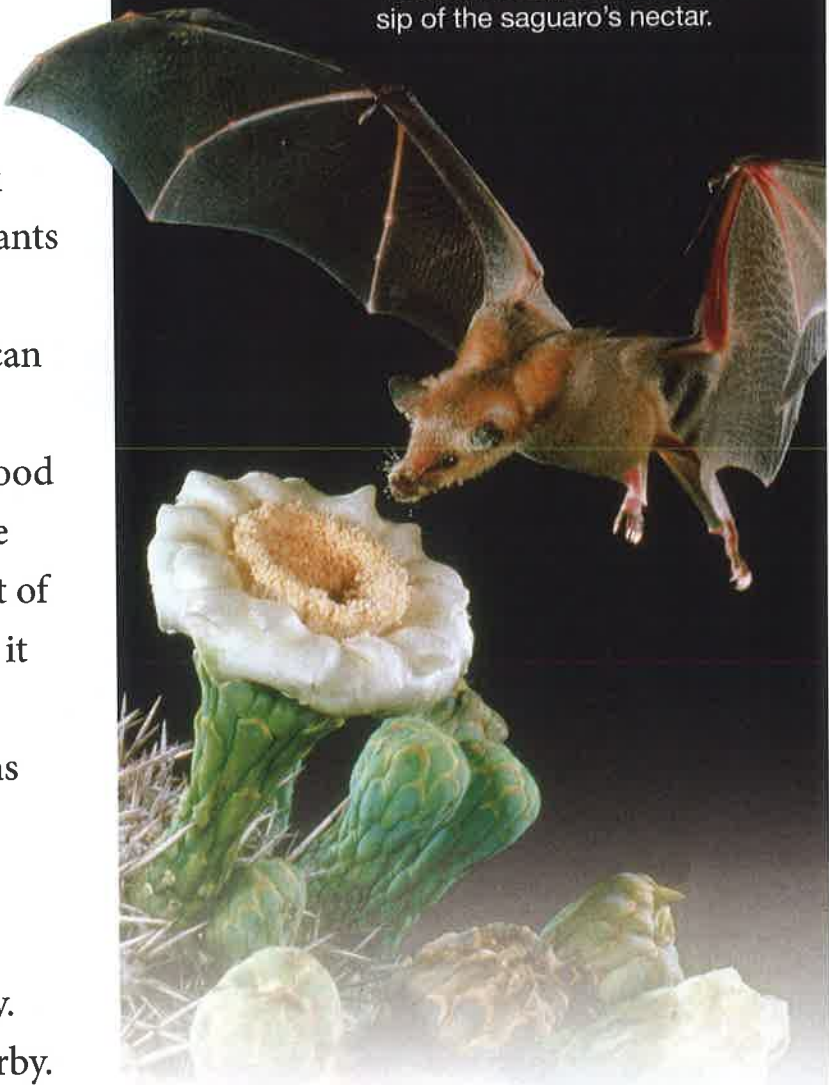
adaptation: a behavior or body part that helps a plant or animal survive

ecosystem: all of the living and nonliving things in an area

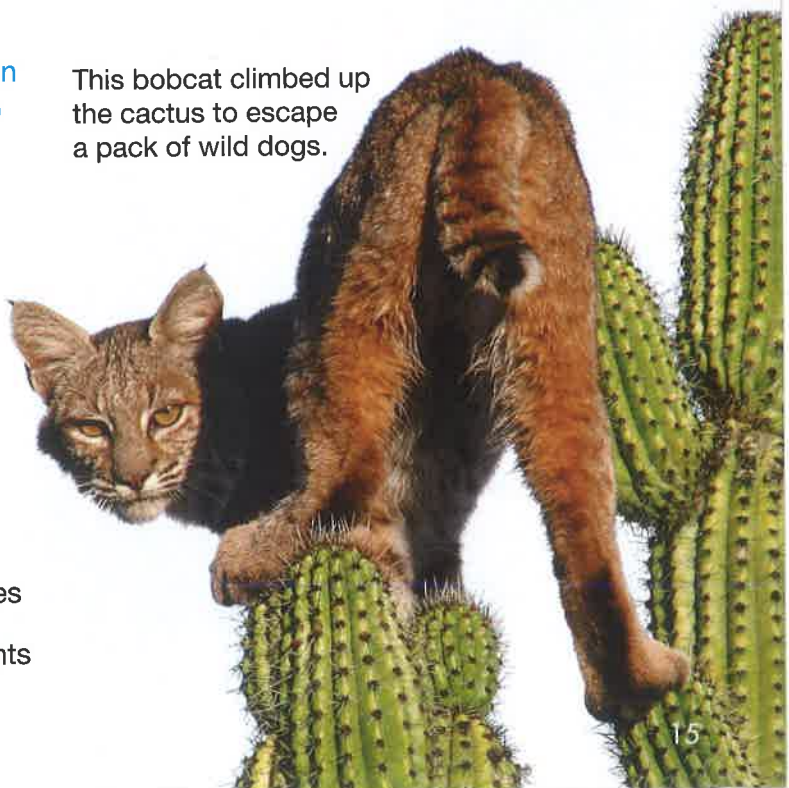
habitat: a place where a plant or animal lives

photosynthesis: the process by which plants use sunlight to make food

This bat swoops down for a sip of the saguaro's nectar.



This bobcat climbed up the cactus to escape a pack of wild dogs.



Life Science

COMPREHENSION STRATEGY:

As you read, think about how each extreme environment is similar to and different from the others.





EXTREME

LIVES

Join some scientists on their dangerous missions. They are going to some extreme environments. Humans could never survive in these places. Yet some plants and animals do. Here, they meet their **basic needs**. They find the food, air, and shelter they need to survive. Find out how.

By Greta Gilbert