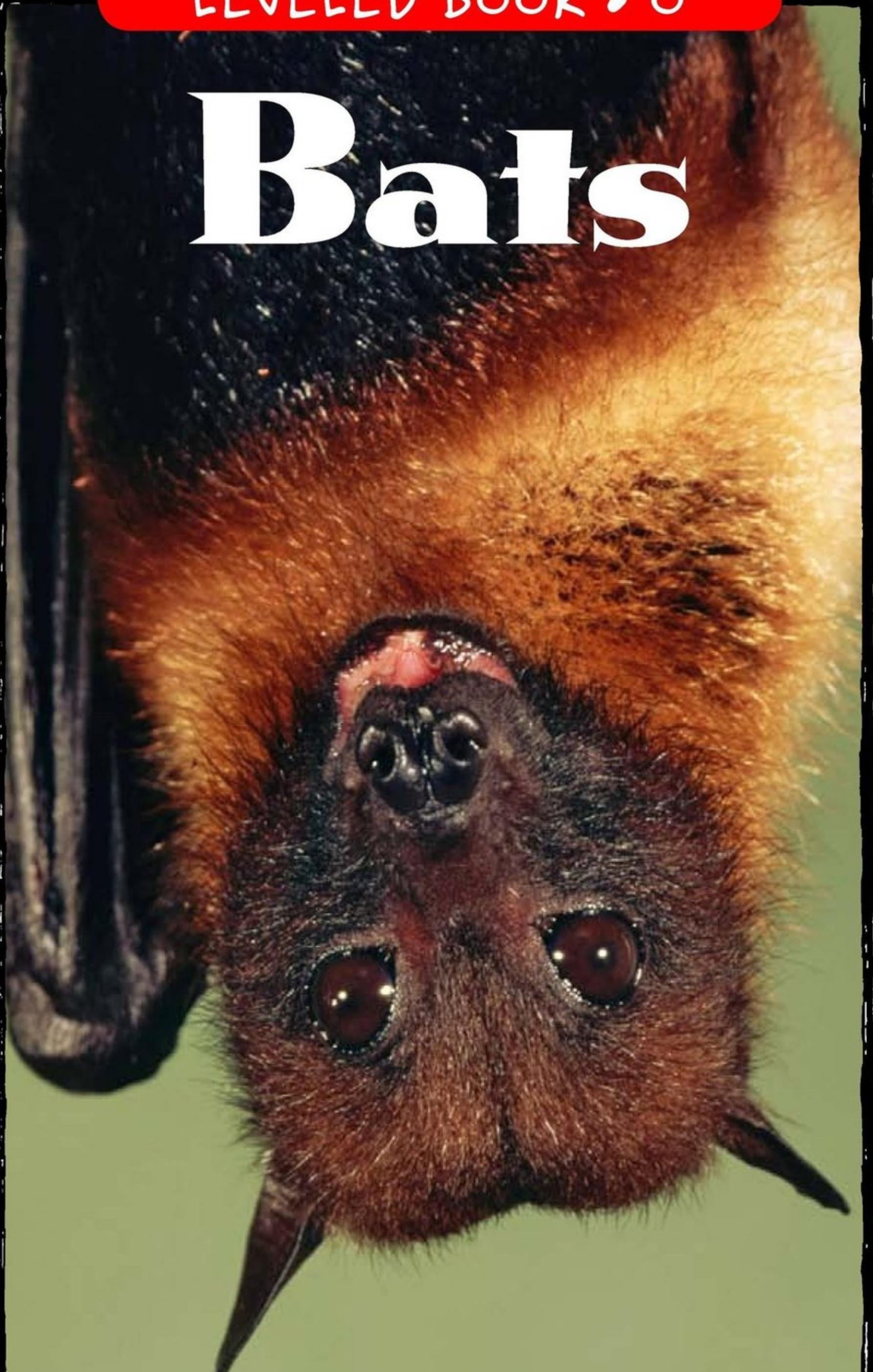


LEVELED Book • O

Bats



Written by Ned Jensen

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A cloud of bats darkens the sky in the evening.

Introduction

Enter a cave just as night approaches, and you might see a dark cloud pouring like smoke from the cave. It's a cloud of sorts, but it's not a rain cloud—it's a “bat cloud.”

Bats like to spend the daytime in the cool darkness of a cave hanging upside down from the ceiling, but nighttime is different—it is time to hunt. So thousands of bats take flight from the cave. They dive and dart about, snatching insects from the air.

About Bats

Bats are one of the oldest groups of mammals to have lived on Earth. According to fossil records, they were sweeping through the air almost 60 million years ago. Bats flew through the Earth's skies before humans walked on the planet. Although bats have been around for all that time, they haven't changed much. Ancient fossils show that bats of long ago were very much like modern-day bats.

Bat fossils are rare because their small, light skeletons do not preserve well. Also, many bats live in tropical forests, where small bones are rarely preserved.



There are close to 1,000 kinds of bats. In fact, there are more kinds of bats than there are kinds of any other mammal. These bats are placed into two groups—**microbats** and **megabats**.

Microbats eat mostly insects, but some also eat small fish, mammals, and amphibians. The smallest microbat is the bumblebee bat, which is about as long as a paper clip. Microbats live in a wide range of places and can be found throughout the world.



Some microbats are very small.



Megabats, such as this fruit bat, have good eyesight.

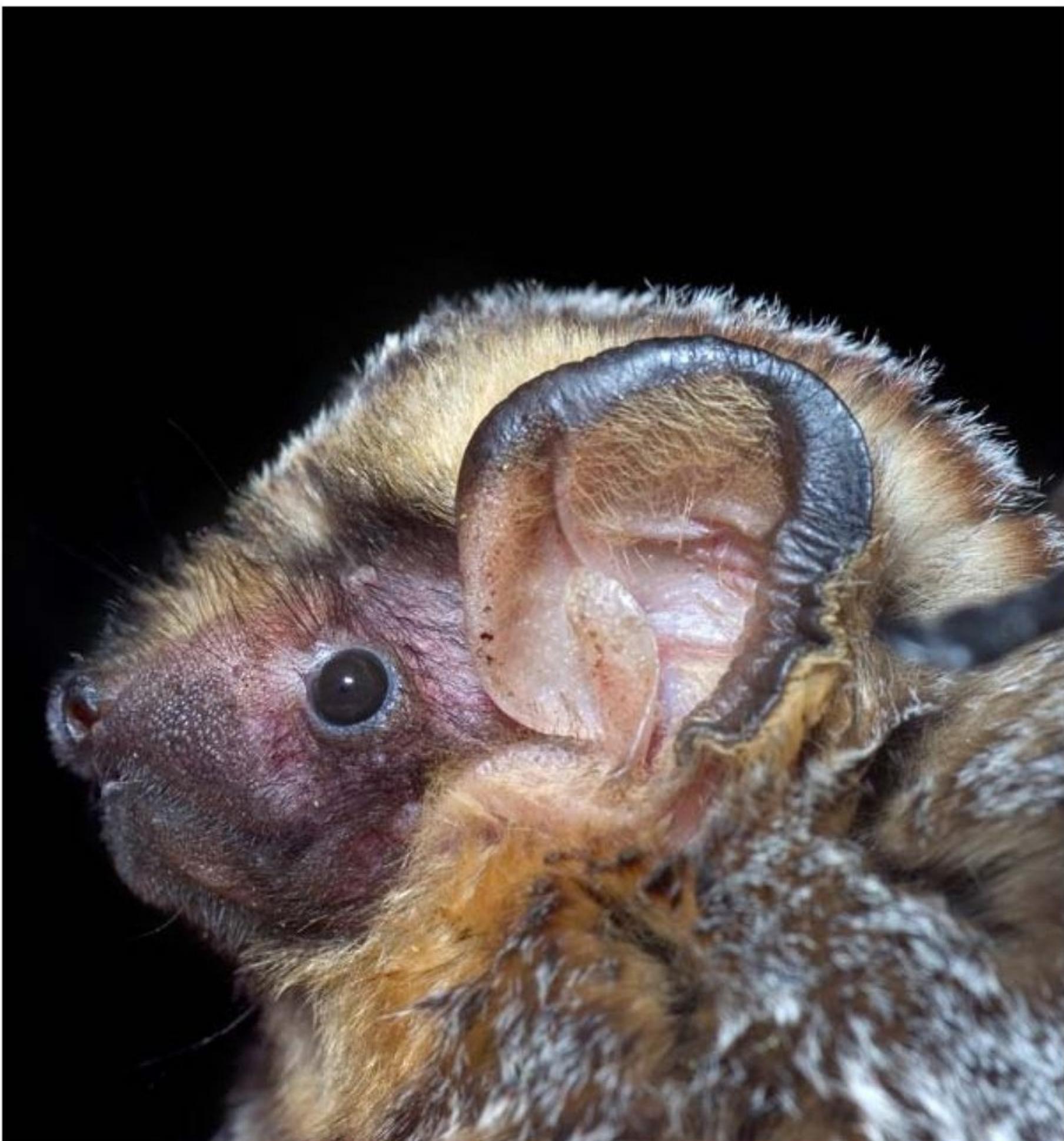
Megabats eat fruits. They are found in warm, tropical areas where lots of fruit grows all year long. The largest megabat is the Malayan flying fox. It is so large that with its wings spread out, it would stretch the length of the average-sized bathtub. While some megabats are big, megabats are not always larger than microbats.



Do you think this vampire bat is ugly or cute?

Bat Features

Bats seem to get a bad rap when it comes to looks. In fact, some people might consider them downright ugly. Others think bats look fierce and scary. If you get to know bats better, you might change your opinion of them. You might even think that some bats are rather cute.



This bat has colorful fur.

Bats, like most mammals, are covered with hair or fur, which is soft and quite short. There are a few types of bats that have only a little fuzz on their bodies. No wonder these bats are called naked bats. Bat fur comes in as many colors as human hair does. There are bats with brown, black, gray, red, and even yellow fur.



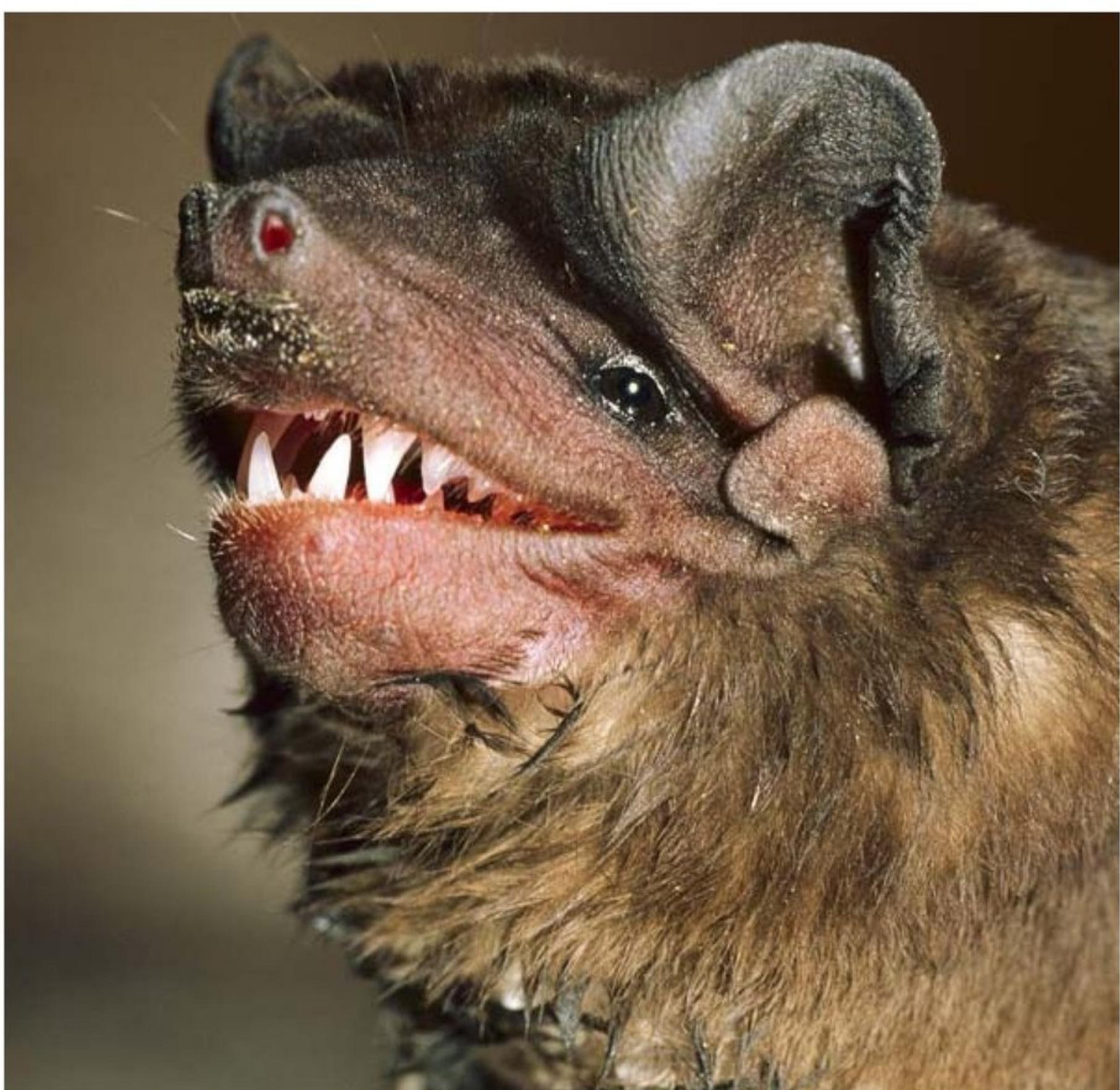
A long-nosed bat shows off its wings while feeding.

Bats are the only mammals that can fly. Flying squirrels are mammals, too, but they don't really fly. They glide through the air after jumping from a tree branch.

Bat wings are made of two thin layers of skin. The skin is so thin that you can almost see through it. A bat's wings are really modified hands that even have small thumbs. The skin stretches between long, thin bones when the bat is in flight and folds up when the wings are not in use. A bat's wings are used for more than flying. If a bat is too warm, it stretches out its wings so heat can escape to cool the bat. If the bat is too cold, it can wrap itself in its wings.

Like you, bats have two sets of teeth. The baby teeth are lost early in a bat's life. They are replaced by a set of 26 to 28 adult teeth. These teeth are sharp and are used to cut and crush food.

Despite what many people believe, bats aren't blind. Bats use their eyes to see during the day and in the early evening. Let's learn how bats find food in the dark.



A bat shows its sharp teeth.



A horseshoe bat in flight

Flight and Feeding

Bats are skilled fliers. The bones of the bat's wings can bend easily to change the shape of the wings. By changing the shape of their wings, bats can quickly change the direction of their flight. In addition to wings, most bats also have a piece of skin that stretches between their legs. When flying, bats spread their legs so that they can use the pouch of skin to help them steer up or down and swerve left or right.

Do You Know?

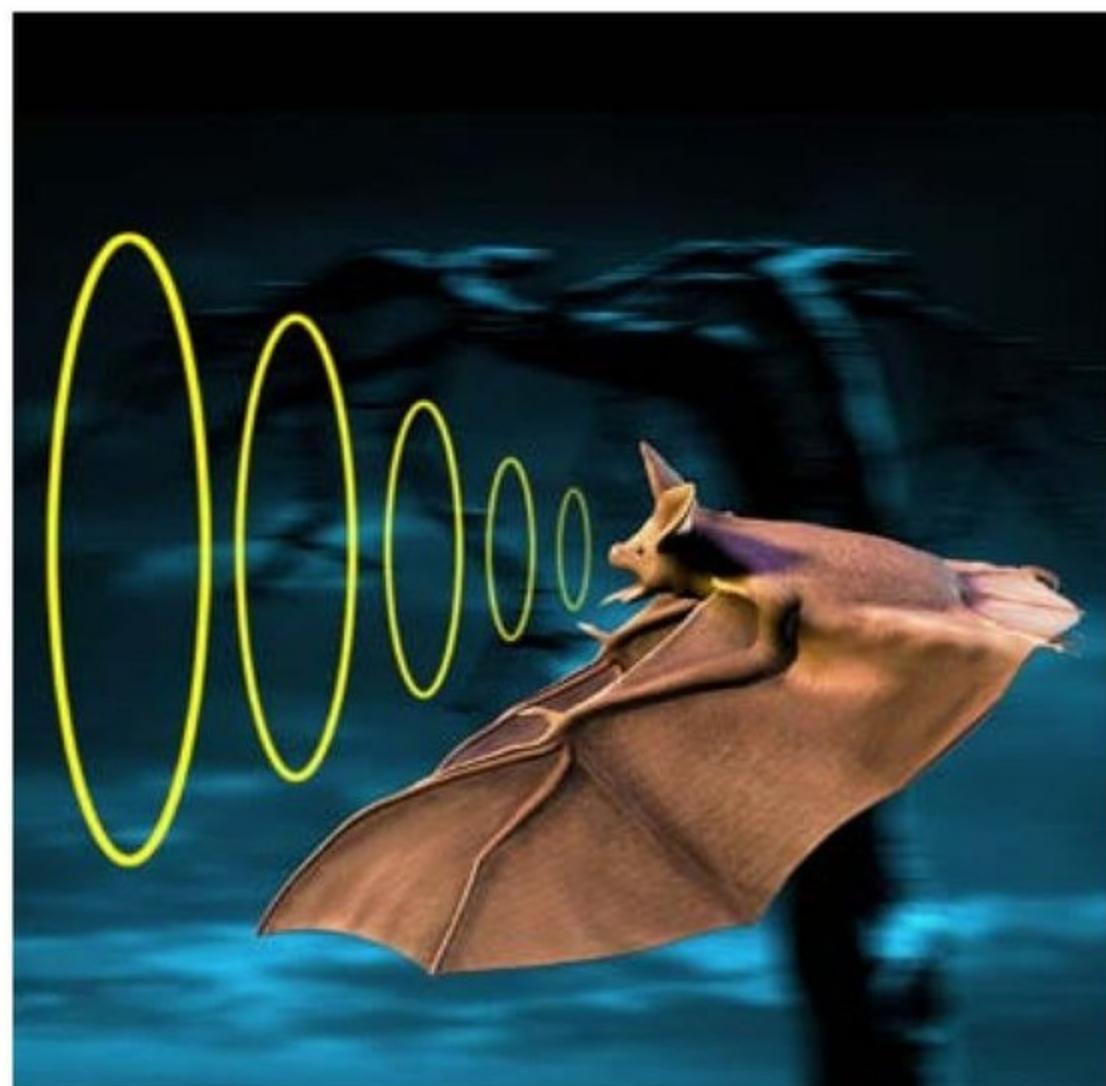
Bats are able to fly high and fast. Bats have been clocked going as fast as 100 kilometers per hour (62 mph). This is as fast as a car speeding down a highway. Some bats can fly 3.2 kilometers (2 mi) high.

We now know that bats are skilled fliers. But skilled flying alone doesn't make bats good hunters. Since bats do most of their hunting in the dark of night, they need more talents than flying in order to hunt.

Microbats also have another feature to help them hunt—**echolocation**. This is the use of sound waves to help bats locate insects in flight. The photo and text below show how bats use echolocation.

How Echolocation Works

- ① The bat sends out a constant stream of beeping noises.
- ② The sound waves spread out ahead of the flying bat. (((
- ③ Sound waves strike objects such as flying insects.
- ④ Sound waves bounce off the insects and echo back))))
- ⑤ The bat picks up the reflected sound with its super-sensitive ears.
- ⑥ Nerves carry a signal from the bat's ears to its brain. The brain interprets the size, distance, speed, and direction of the insect. Zap—it's dinnertime.





A bat prepares to grab an insect for a meal.

When a bat finds an insect, it sends out more beeps or clicks and sends them out much faster. It might send out up to 200 beeps or clicks per second. As it closes in on its target, it sweeps up the insect with a wing and scoops it into a pouch that is formed with the skin between its legs. Later, the bat will stick its head into the pouch to gobble up the meal. Bats also snatch insects out of the air with their mouths.

The combination of skilled flying and echolocation makes microbats excellent hunters at night. The next time you are out at night, take a look skyward. You will likely see bats darting through the air, collecting insects in their tail pouches. Observe how quickly they change direction. They are responding to brain signals telling them where food can be found.



Bats can change direction in flight very quickly.

Do You Know?

Some microbats eat up to 600 mosquitoes an hour, and some will eat up to 3,000 insects in a single night of hunting.

Bat Behavior

Bats are not the mean, frightening creatures that many people think they are. They don't get into your hair or attack people, and there are no human vampires that turn into bats. The truth is that bats are shy, gentle creatures. In fact, bats are our friends. Just think of how many insects would be around if it were not for bats.



Two tent-making bats huddle together.



The claws of a flying fox, the largest of all bats

Can you imagine sleeping while hanging upside down with blood rushing to your head? Well, it's not a problem for bats. Bats sleep upside down. They cling to the undersides of surfaces using the claws on their toes. Hanging upside down makes it easy to take off to fly. All they have to do is let go and begin flapping their wings.

Many bats **hibernate** in the winter when there are no insects to hunt. Before hibernating, bats eat lots of food, which they store as extra fat. They depend on this fat to survive during the winter.



These bats hibernate close together for extra warmth.

Some bats **migrate** to warmer areas during the winter. Red bats fly all the way from Canada to Mexico rather than spend the winter in the cold. There is even a bat in Europe that flies over 1,600 kilometers (1,000 mi) to spend the summer in Russia. Don't expect to see bats migrating, since they fly at night.

Female bats give birth to one or two babies every year. They are the only flying animals that nurse their young on milk. After a baby bat is born, it crawls up to its mother's chest and clings there with its claws.

It feeds off its mother's milk and even clings to the mother's fur when she goes hunting. But baby bats don't hang around for long. Many are able to fly and catch their own meals only three weeks after birth.



A baby Gambian fruit bat clings to its mother.

Do You Know?

Some bats are threatened by a deadly disease. White-nose Syndrome has killed more than a million bats in thirteen states since it was first discovered in 2006.

Try This!

Building a Bat House

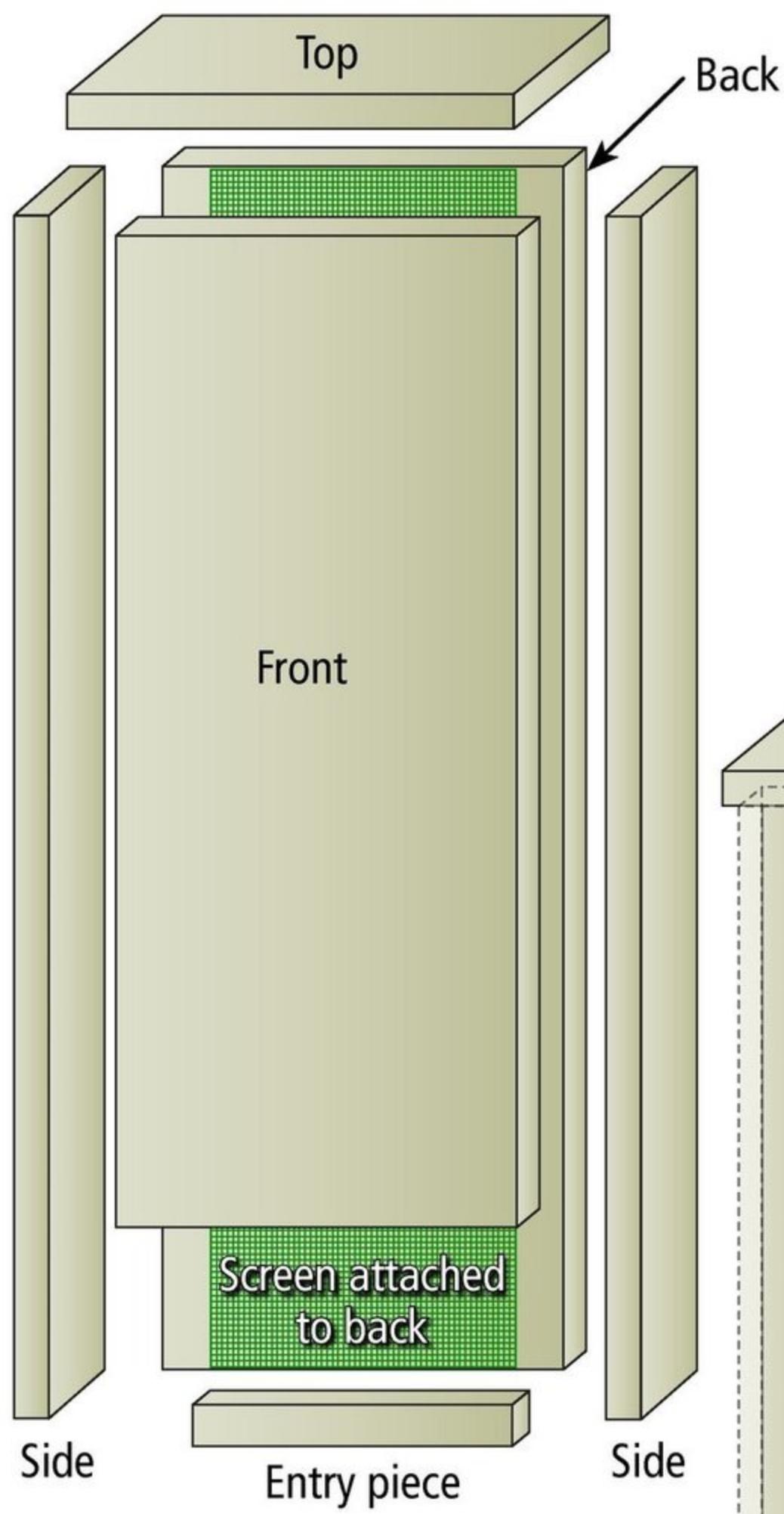
Bats are important animals, and they need places to live. You can help by building a bat house. Here's how to do it.

Materials:

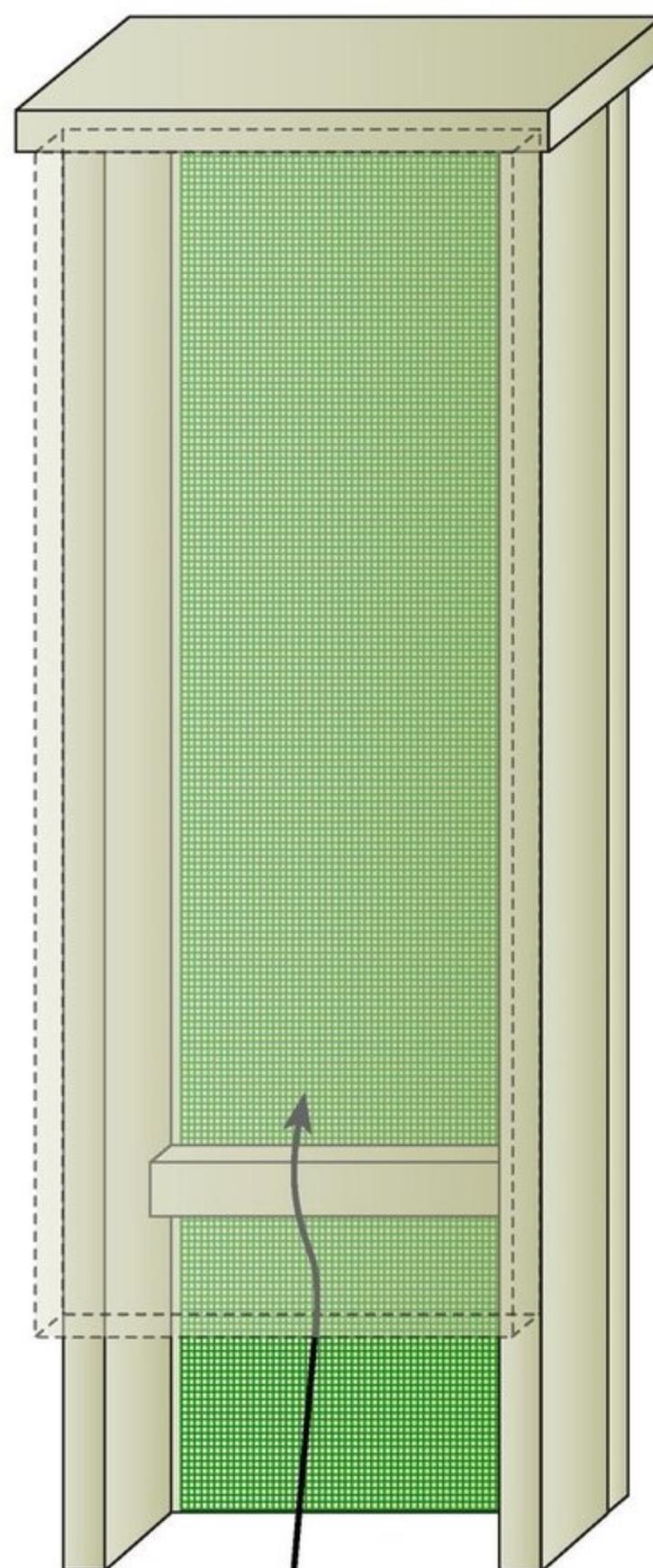
- hammer
- 24 nails
- saw
- 25" x 27" piece of plywood
- 7" x 27" piece of screen

Steps:

- 1 Get some wood. Outdoor plywood that is $\frac{1}{2}$ " to $\frac{3}{4}$ " thick works well.
- 2 Measure and then cut six pieces of wood from the plywood as follows:
 - 1 back piece 9" x 27"
 - 2 side pieces 3" x 27"
 - 1 front piece 9" x 21"
 - 1 roof piece 4" x 10"
 - 1 entry piece 7" x 1"
- 3 Put a piece of 7" x 27" screen on the back piece before nailing the house together. The screen gives the bats something to hang onto.



- 4 Nail the boards together as shown.



- 5 Hang your bat house high in a tree or on the side of a building. Hang it where it is not too sunny.

Bats enter here;
entry piece keeps
larger animals out

Glossary

echolocation (n.)	finding objects by listening to bounced sound waves (p. 13)
hibernate (v.)	to sleep through the winter (p. 18)
megabats (n.)	fruit-eating bats that generally have large eyes and good eyesight (p. 5)
microbats (n.)	bats without underfur that generally use echolocation to find food such as insects (p. 5)
migrate (v.)	to move from one region to another with the seasons (p. 18)

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Front cover: Flying fox bat

Title page: Vampire bat

Back cover: Pallid bat in flight

Bats

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