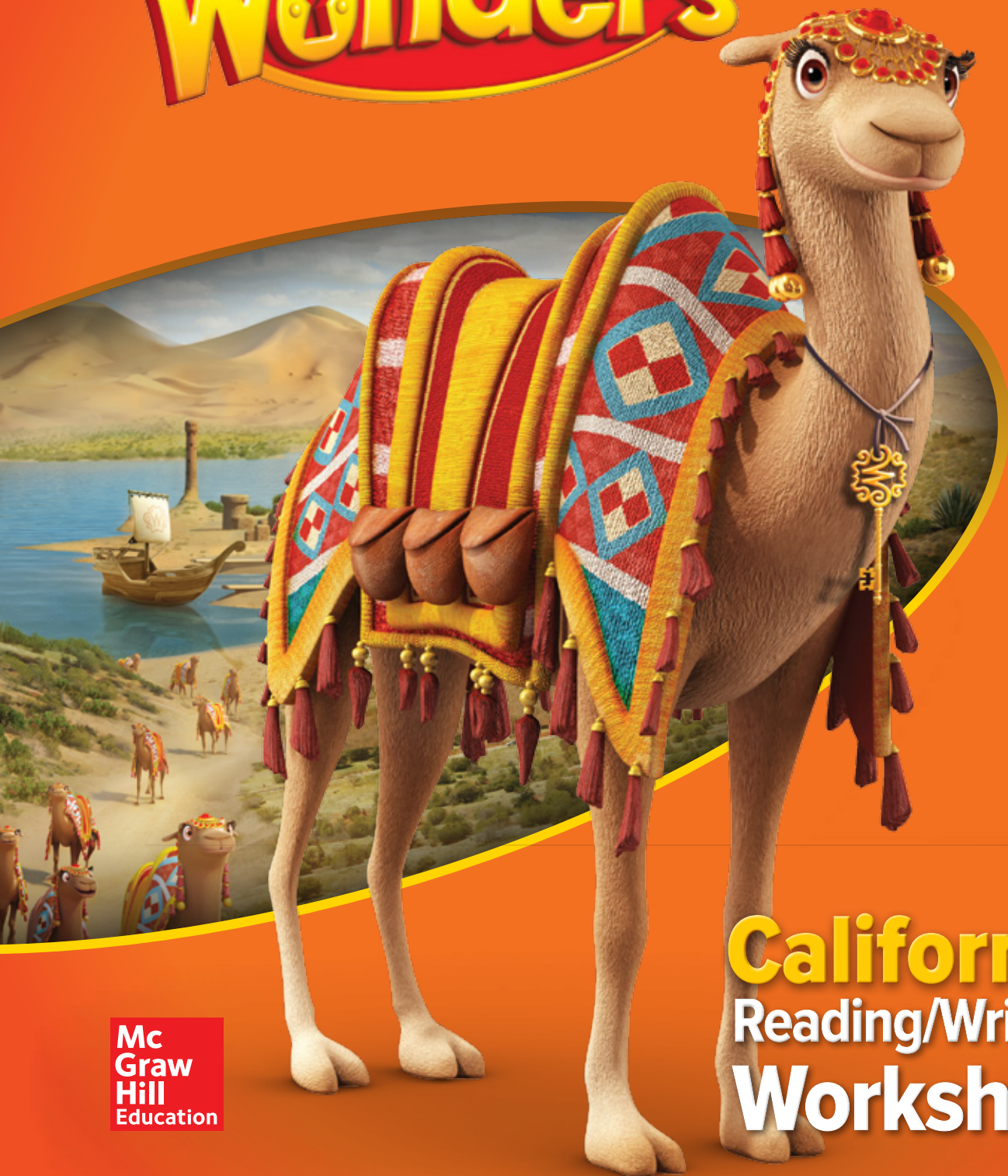


Wonders



Mc
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Education

California
Reading/Writing
Workshop



Essential Question

What ideas can we get from nature?



Go Digital!



IDEAS FROM NATURE

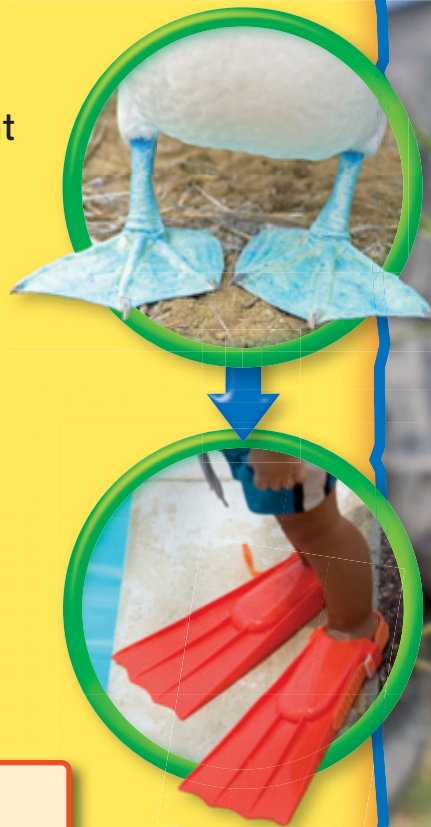
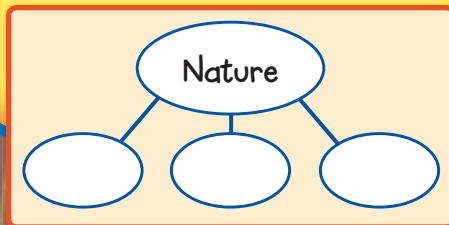
This spider may be small, but it inspires big ideas. Its webs are super strong, and scientists want to know why.

- ▶ Scientists look to nature for new ideas.
- ▶ These ideas help people in many different ways.

Talk About It



Talk with a partner about how nature inspires new ideas.
Write words you have learned.



Vocabulary

Use the picture and the sentence to talk with a partner about each word.



effective

The broom is an **effective** tool for sweeping up leaves and dirt.

What is an effective tool for cutting paper?



example

The apple is a good **example** of a healthy fruit.

Name an example of a healthy vegetable.



identical

Mark and Matt are **identical** twins because they look alike.

What makes two things identical?



imitate

This robot can **imitate** the way Cody moves.

What does it mean to imitate something?



material

The baby's blanket is made of a soft, warm **material**.

Describe the material your shirt is made of.



model

Kevin and I play with my **model** airplane in the park.

Why does it help to have a model?



observed

Meg and Joann **observed** the fish, and wrote down what they saw.

What is another word for *observed*?



similar

My dad and I like to look alike, so we wear **similar** shirts.

What is a word that means the opposite of *similar*?

Your Turn

COLLABORATE



Pick three words. Then write three questions for your partner to answer.

Go Digital! Use the online visual glossary

BATS DID IT FIRST



(bkgd)©Radius Images/Alamy; (inset)Ewen Charlton/Moment/Getty Images



Essential Question

What ideas can we get from nature?

Read about how bats inspired a new cane for blind people.

Nature is full of great ideas. Many inventors and scientists just step outside and look around for inspiration and ideas. They often **imitate**, or copy, what they see outdoors. They use nature to inspire their inventions.

One amazing invention was inspired by bats. It's a special cane that helps blind people navigate and get around.

This boy is blind and uses a special cane to help him get around.





Canes Lead the Way

Many blind people use canes. They tap the canes on the ground in front of them to locate objects that may be in the way. This helps them move around safely as they do their shopping or walk outdoors.

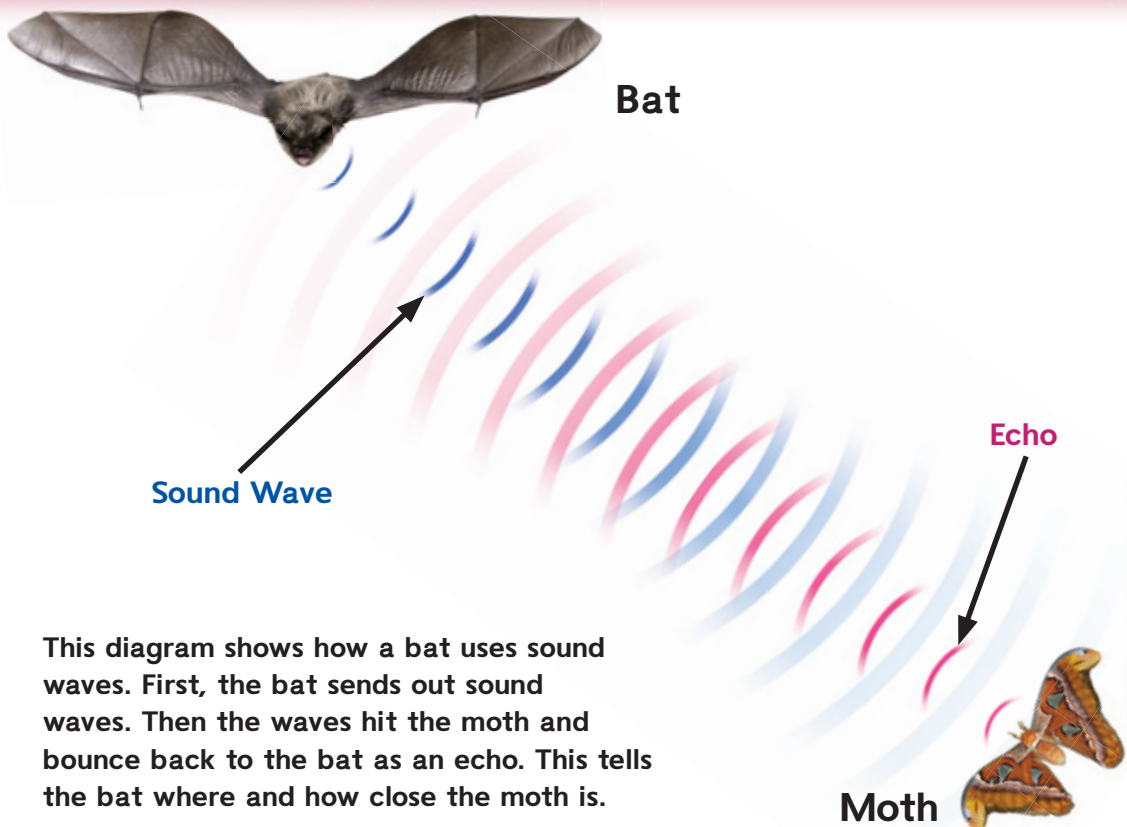
The bat-inspired cane is different from these canes. It sends out sound waves, or signals. These signals are almost **identical** to the ones bats use to find their way in the dark.

How Bats Get Around

The scientist that came up with the idea for the new cane was inspired by watching bats. He **observed** the way bats fly at night. The bats make high-pitched sounds that people cannot hear. These sounds create an amazing navigation system for the bats. Here's how it works.

Bats send sound waves out through their mouth or nose. These sound waves hit objects and then bounce back as an echo. The echo tells the bats how far away an object is and how big it is. This information helps bats find bugs to eat. It is also an **effective** way to keep bats from bumping into trees and other bats.

How Bats Use Sound Waves

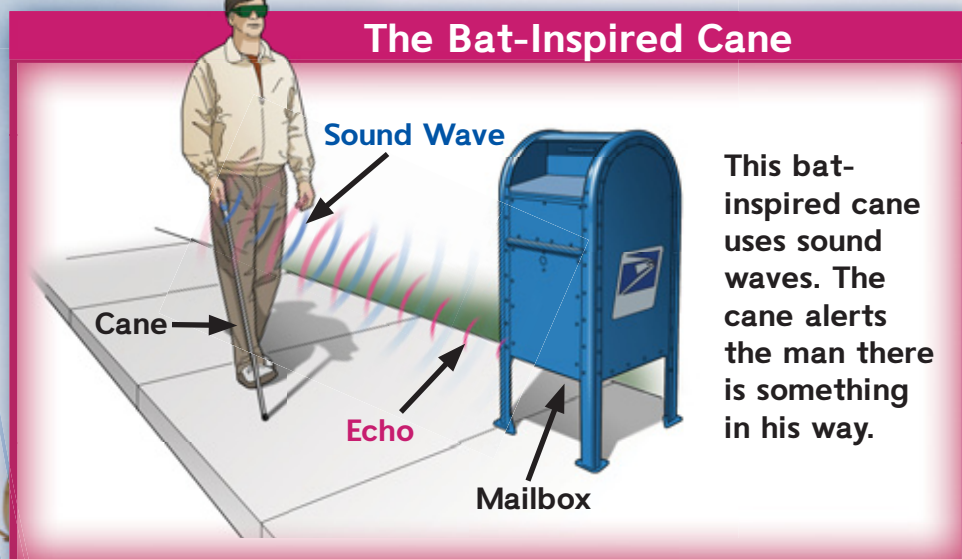


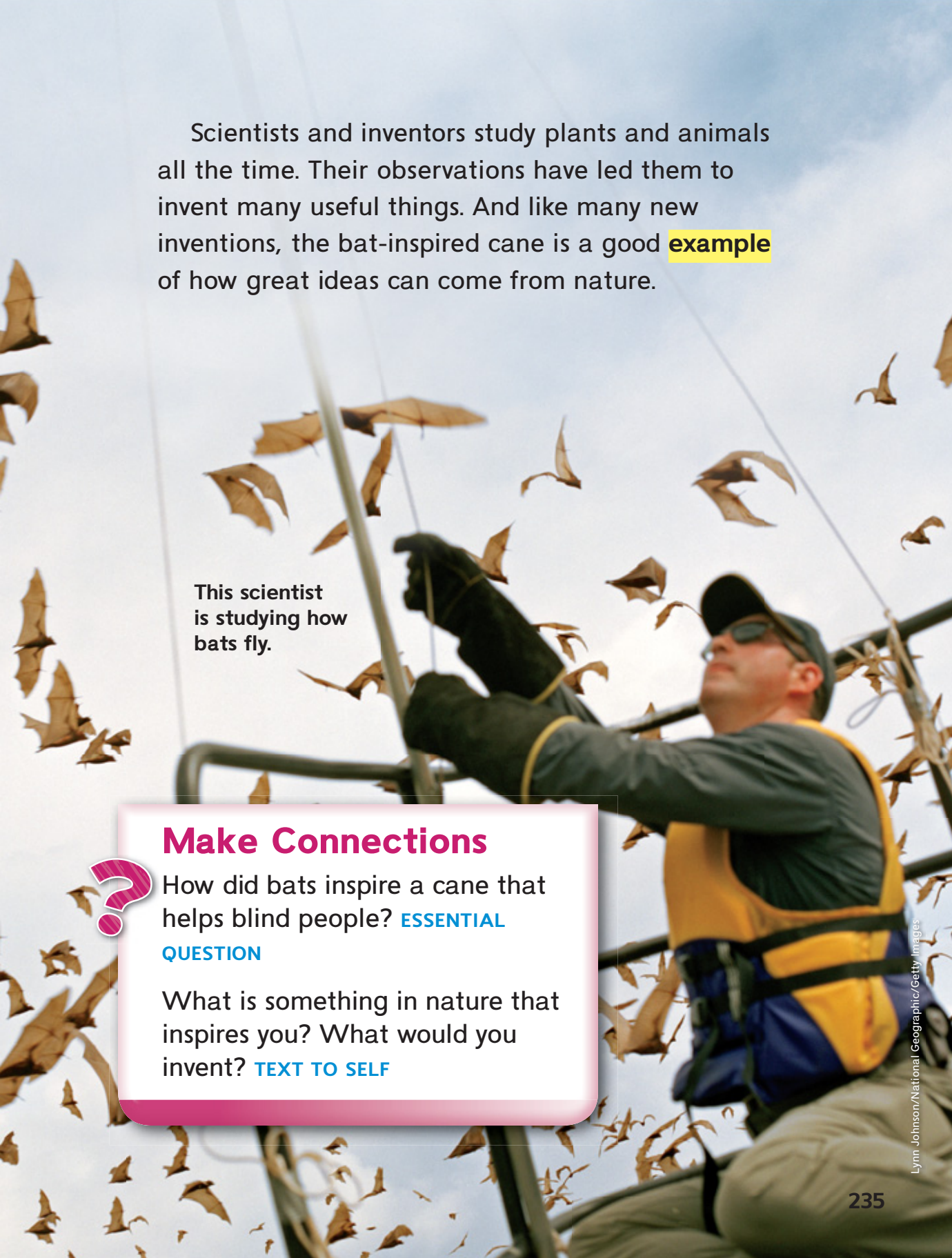
A Batty Idea

The scientist who invented the new cane took what he learned from observing bats. He used a **similar** idea. He started with an ordinary white cane. He wanted the cane to imitate the way bats use sound waves. So, he sketched plans and made a **model** of his invention. When he built the cane, the scientist used a special **material** that was lightweight and strong. Then he added sound waves. Finally, a team of scientists tested the cane. It worked!

How the Cane Works

The handle of the cane sends out signals. The signals bounce off objects in front of the cane. Then an echo bounces back to the cane's handle. The person holding it feels buttons on the handle vibrate, or shake. These buttons tell the person how far away and how big the object is.





Scientists and inventors study plants and animals all the time. Their observations have led them to invent many useful things. And like many new inventions, the bat-inspired cane is a good **example** of how great ideas can come from nature.

This scientist is studying how bats fly.

Make Connections



How did bats inspire a cane that helps blind people? **ESSENTIAL QUESTION**

What is something in nature that inspires you? What would you invent? **TEXT TO SELF**

Summarize

When you summarize, you tell the most important ideas and details in a text. Use important details to help you summarize “Bats Did It First.”



Find Text Evidence

How did one scientist come up with the idea for the new cane? Identify important ideas and details, and summarize them in your own words.

page 232

How Bats Get Around

The scientist that came up with the idea for the new cane was inspired by watching bats. He **observed** the way bats fly at night. The bats make high-pitched sounds that people cannot hear. These sounds create an amazing navigation system for the bats. Here's how it works.

I read that one scientist came up with an idea for a new cane. He watched bats use sound waves to navigate at night. Those details help me summarize. The way bats use sound waves led to the invention of a new cane.

Your Turn

COLLABORATE



Reread “How The Cane Works” on page 234. Summarize the important ideas and details about how the new bat-inspired cane works.

Main Idea and Key Details

The main idea is the most important point the author makes about a topic. Key details tell about the main idea. Put the details together to figure out the main idea.



Find Text Evidence

What details tell about how bats fly at night? I can reread page 233 and find key details. Then I can figure out what they have in common to tell the main idea.

Main Idea
Detail
Bats make high-pitched sounds through their mouth and nose.
Detail
These sound waves hit objects and bounce back as an echo.
Detail

Your Turn

COLLABORATE



Reread. Find more key details about how bats fly at night. List them in your graphic organizer. Then use the details to figure out the main idea.

Go Digital!*Use the interactive graphic organizer*

Expository Text

“Bats Did it First” is an expository text.

Expository text:

- Gives facts and information about a topic
- Includes text features such as photographs, captions, and a diagram

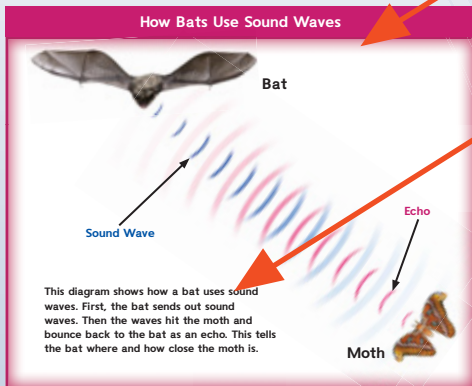


Find Text Evidence

I can tell that “Bats Did It First” is an expository text. It has photographs with captions. It also has a diagram that shows how bats fly at night.

page 233

Bats send sound waves out through their mouth or nose. These sound waves hit objects and then bounce back as an echo. The echo tells the bats how far away an object is and how big it is. This information helps bats find bugs to eat. It is also an **effective** way to keep bats from bumping into trees and other bats.



233

Text Features

Diagram A diagram is a picture that gives more information about the text. Labels name the parts of the diagram.

Caption A caption tells about a photograph or diagram.

Your Turn

Look at the diagram on page 233. Explain how the bat finds food at night.

COLLABORATE



Root Words

A root word is the simplest form of a word. It helps you figure out the meaning of a related word.



Find Text Evidence

In "Bats Did It First" I see the word invention. I think the root word of invention is invent. I know invent means "to make something new." An invention is "something new that is made."

One amazing **invention** was inspired by bats.



Your Turn

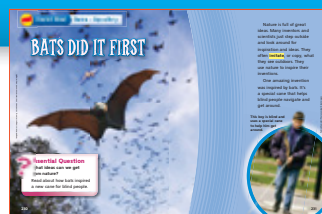
COLLABORATE



Find the root word. Then use it to figure out the meaning of each word.

inspiration, page 231

navigation, page 232



Pages 230-235

Write About the Text



Aisha

I answered the question: *Why is the new cane the scientist designed better than earlier models? Use details from the text.*

Student Model: Informative Text

Topic Sentence

I introduced the main idea in the first sentence.

Supporting Details

I included text evidence to develop the topic of my paragraph.

The new cane is better than

earlier models because it can tell blind people how far away objects are by using signals. Older models

cannot do this. These signals are like the ones a bat sends to help it hunt in the dark.



When the cane's signal
bounces off an object in front of
it, buttons on the cane vibrate.
This tells the blind person that
something is there. The new
cane's design will make it safer
for blind people to walk without
bumping into objects.

Strong Conclusion

My final sentence
retells the main idea
in different words.

Grammar

This is an example
of a **future-tense
verb**.

**Grammar
Handbook**

See page 483.

Your Turn

How does the author help us
understand what sound waves
are? Use details from the text.

Go Digital!

Write your response online.
Use your editing checklist.