



Little Brown Bat – What’s Your Habitat?

EXPLORATION QUESTIONS

Where do little brown bats live and what makes up their habitat?

MATERIALS

- Pencils
- Copies of the story, “The Forest of Beatrice, the Little Brown Bat”
- Pictures of story characters (included)
- Copies of student worksheets
- Crayons and/or colored pencils
- Story cloth components (all optional)
 - Green story cloth (2 yards of material)
 - cardstock trees
 - cardstock dead trees
 - Stream (blue fabric)
 - Flying insects
 - Raccoon toy
 - Leaves – various shapes and colors
 - Plastic ants, pill bugs, and worms
 - Rabbit toy

OVERVIEW

Students will read and/or listen to a story about a boy and a little brown bat. Students will identify what little brown bats need to survive (food, water, shelter, and space) and describe/draw a picture of each of the components of the bat’s habitat. They will also describe characters in the story and answer questions to demonstrate their understanding.

VOCABULARY

Habitat, insectivore, mammal, predator, pup, roost, shelter, survive

GROUP SIZE

any

AGE

7-11

Introduction

All plants and animals, whether they are wild or domesticated, have the same basic needs. A habitat is the place where an animal or plant lives and gets everything it needs to survive, including food, water, shelter (protection from predators and the environment including sun, rain, snow, etc.) and adequate space to live. If one or more of these necessary components are removed from a plant or animal’s habitat, it will not survive.

Within any habitat there are many smaller microhabitats, areas in which conditions vary from the habitat as a whole. For example, a cavity in a tree may be warmer, more humid, and receive less wind than the surface of the tree. Or, a fallen log inside a forest may provide microhabitat suitable for insects that need cooler and wetter conditions than are found in the wider forest habitat.

Habitat includes the entire area that contains the components needed by a plant or animal. While thinking of habitat as a plant or animal’s home is a good way to explain habitat, it is really much bigger than just a house. Habitat is the entire neighborhood where an animal gets the food, water, shelter, and space it needs to survive. The amount and quality of these needs varies a great deal from species to species.

There are many different types of habitats including caves, forests, rivers, wetlands, and grasslands. A deer’s habitat might be a combination of forests and fields. A sea turtle’s habitat might be the ocean and the beach. A monarch butterfly’s habitat might stretch all the way from Canada where it breeds in the summer to Mexico where it spends the winter.

Habitats for Bats

Bats have very complex habitat needs. They use a variety of habitat types depending on the species of bat, the time of year, and what they are doing – hunting for food, raising their babies, or hibernating through the winter. In order to survive, insectivorous bats need insects to eat, water to drink, places to sleep and raise their young (called roosts), and places to hibernate. Places where bats hunt for insects are called foraging habitats. Bats often travel between roosts and foraging habitats using trails, maintained rights-of ways, or wooded streams and rivers.

Rivers, streams, ponds, and lakes are all used by bats because many species hunt for insects over water and almost all need to drink daily. Some bats use caves or other natural cavities such as rock outcrops, cliff faces, or even exfoliating bark on trees to roost, hibernate, and raise their young. Bats can even be found in buildings - agricultural buildings (e.g. farmhouses, barns, and outbuildings) of traditional wood, brick, or stone construction and/or with exposed wooden beams, and buildings and

structures with slate roofs, stone walls, hanging slates, hanging tiles or weather boarding, are attractive to bats. This is especially true when these buildings are located near woods and/or water. Bats are also found in other human-made structures such as tunnels, mines, cellars, air raid shelters, bridge structures, and aqueducts. You just never know where you might find a bat!

Little Brown Bats

Like many species of bats, little brown bats use different types of habitat throughout the year based on their sex and reproductive status. While males and females will often use similar habitats in the winter for hibernation (humid caves and mines with constant temperatures), reproductive females often use different summer habitat than males and non-reproductive females.

During the summer, little brown bats commonly roost in human-made structures, under tree bark, in rock crevices, and in tree hollows. Pregnant females roost together in small colonies (called maternity colonies). Females give birth to a single pup each year and a maternity colony usually includes 300-1200 bats (including mothers and their pups). Occasionally, these colonies may be as large as 3,000 bats. Pregnant females select roosts based on temperature and shelter provided. They prefer hot and humid roosting sites. Maternity colonies are often found in dead or dying trees in crevices or hollows. They will rarely form colonies under loose tree bark. Little brown bats are also found in bat houses and buildings. Maternity colonies do not occur in caves or mines because pregnant females need warmer temperatures to raise their young.

Males and non-reproductive females often roost alone or with a few other bats. They do not share the high-temperature needs of maternity colonies. Males and non-reproductive females may use tree crevices, buildings, and occasionally caves and mines as day roosts during the summer. Both sexes choose roosts based on proximity to water. This activity focuses on a pregnant female little brown bat named Beatrice and her summer habitat.

Get Ready – Background Activities

1. Assess your students' knowledge of habitat needs by asking questions such as:
 - What do all humans need to survive?
 - Which of these do plants and animals also require?
 - Do all plants and animals live in the same place?
 - Do they need the same amount of space to live?
2. Guide your class in generating a list of habitat needs by asking them if they have pets at home. Considering different types of pets will help illustrate how these animals have the same basic needs. Ask the class what a pet cat needs to live and stay healthy? How about a turtle or a hamster? Students will give many answers. Write the list of each animal's needs on the board.
3. Tell your students that a habitat is the place where an animal or plant lives and gets everything it needs to survive. These needs can be grouped into four major categories including food, water, shelter, and adequate space to live. See if your students can guess these categories by working through the following questions:
 - What factors do you think about when taking care of these pets?
 - Could all of these pets (cat, turtle, and hamster) live in a small tank or cage? Why or why not?
 - Could the cat and the hamster live in the same space?
 - Would these animals be able to survive outside during the summer? What about the winter?
4. Challenge your class to group the list of the pets' needs that they created in step two into the four basic categories: food, water, shelter, and adequate space to live. Shelter may mean protection from other animals (called predators) or protection from the sun, wind, snow, or other elements. Did they group the listed items into these categories? Allow students to rearrange items in the list if needed.
5. Now ask the class to think about the habitat needs of wild animals. Ask the class to describe what a forest is and how it is different than their home. Have they ever visited a forest? What

was it like in the forest? What kinds of things did they see while they were there? What kind of animals live in a forest?

Get Set – Hand Out Materials

1. Tell the students that they are going to learn more about habitat by reading and/or listening to a story about a boy named Billy who meets a little brown bat. They need to listen carefully to the things that happened to him and the things that he saw.

2. If students will be reading along with you, give students copies of the story, “The Forest of Beatrice, the Little Brown Bat.” Also, give students copies of the “Student Worksheet – Idea Wheel – Little Brown Bat Habitat. During the reading, students will identify and write down (or draw a simple picture) of the little brown bat’s needs (food, water, shelter, space).

Go! – Share the Story

1. There are many ways that you can use the materials for this activity. Here are some suggestions:

- Read the story, “The Forest of Beatrice, the Little Brown Bat” aloud. Spread out the green story cloth and invite the students to sit in a circle around it. Hint – if they sit on the edge of the cloth, they will be less likely to creep closer to you as you read and less likely to block the view for the rest of the group. As you read, hold up the illustrations of the story’s characters as they make an appearance in the story. Slowly move around the circle so that the students can see the illustrations. After reading the story, pass out several story props to each child. Now, read the story again. This time, invite the students to add the props to the story cloth as they appear in the story. For example, when Beatrice and Billy fly over the small stream, invite the child with the water to spread the blue fabric on the story cloth. Allow time for students to place the props before continuing the story.

- Assign students to read the lines of the characters in the story (narrator, Billy, Beatrice, and earthworm). You can highlight each character’s lines in a different color to make it easier for students to read the correct sections. The readers can also use the illustrations to put

on a puppet show. Attaching the images to popsicle sticks will provide an easy way to hold up the characters as they appear in the story. Or, to involve more students, you could also hand out the illustrations to additional students to hold up as each character makes an appearance in the story.

- Read the story aloud or with the students. Have students find all the descriptive or sensory words that describe Beatrice’s habitat and underline them or put them into a chart.

2. After reading the story, have students complete the idea wheel on the student worksheet. Students will first label each section as one of the four main components of habitat - food, water, shelter, space. Then, students will write down notes and/or draw pictures of the components of a little brown bat’s habitat in the appropriate section. For younger students, you may need to reread the story as they fill out the sheet, pausing during the parts of the story that discuss these specific needs.

3. Discuss the answers to the following questions:

- What is the setting of the story?
- Who is the main character(s)?
- What did Billy hope to see when he first went into the woods near his house?
- How did Billy feel about the forest before he met Beatrice?
- What did Billy do to become Beatrice’s size?
(Safety note! Please remind students that they should never touch or handle bats or other wild animals.)
- What kinds of things did Billy see when he traveled around with Beatrice?
- What types of animals lived in different parts of the tree?
- What would happen to Beatrice if the tree in which she was living fell down to the ground?
- Did Billy discover anything that you already knew?
- Did Billy discover anything that was new to you?
- How did Billy feel about the forest at the end of the story?

4. Discuss how the forest provides food, water, shelter, and space for Beatrice’s habitat. Review the habitat worksheet as a whole group.

5. Hand out the “Connect the Dots - Little Brown Bat Habitat” worksheet to students. Have them complete the image (and practice counting numbers) by

connecting the dots from 1 to 60. When they have completed the image, discuss what habitat components are visible in the completed picture. If time allows, have students draw additional habitat components (insects flying in the sky, a pond or stream near the tree, etc.). Early finishers can draw an animal that they could meet if they were on a journey with Beatrice, the little brown bat.

Reflect – Student Evaluation

1. Name the essential requirements that all plants and animals need to survive (food, water, shelter, space – all found in the plant or animal’s habitat)
2. Accurately describe the habitat needs of a pregnant little brown bat.
3. Student worksheets complete; correct and thoughtful answers in all sections.
4. Full participation in discussion questions.

Go even further! – Additional Activities

1. Complete the Project EduBat mural (it shows all the habitat components needed by bats!). The Project EduBat mural explores the importance of bats to people and the environment across the country. Starting with our eastern forests, traveling through the agricultural lands of the Midwest, and ending in our southwestern deserts, this mural explores the various ways that bats are woven into our lives. The mural consists of 25 individual sheets that can be printed on separate 8 ½ x 11” sheets of paper and is available at: <http://batslive.pwnet.org/edubat/posters.php>
2. Have students complete Billy’s homework assignment. It’s always great to get outside! If your school has a natural area, take a short hike outdoors to look for animal homes. Check out the variety of plants and animals present in a natural area by looking for different sizes, shapes, colors, and movement. If your school doesn’t have a natural area, ask students to find a natural area near their home and report back on what they found interesting. Did they find any of the things mentioned in Beatrice’s story? To find a park or forest near you or for other suggested activities that can be completed during your time outdoors, visit <http://www.discovertheforest.org>.

Further Reading and Resources – Discover More

About Habitats:

Dialogue for Kids - <http://idahoptv.org/dialogue4kids/season10/habitat/facts.cfm>

Habitats - <http://a-z-animals.com/reference/habitats>

What is Habitat – http://happeninhabitats.pwnet.org/what_is_habitat/

What’s Your Habitat? – <https://www.nwf.org/pdf/Schoolyard%20Habitats/whatsyourhabitat2.pdf>

About Habitats for Bats:

Bat Habitat - <http://www.batworlds.com/bat-habitat/>

Where Do Bats Live – http://www.bats.org.uk/pages/Where_do_bats_live.html

About Little Brown Bats:

Little Brown Bat Description – <https://www.nwf.org/Wildlife/Wildlife-Library/Mammals/Bats/Little-Brown-Bat.aspx>

Little Brown Bat, *Myotis lucifugus* – http://www.biokids.umich.edu/critters/Myotis_lucifugus

Little Brown Bat Species Account – <http://www.batworlds.com/little-brown-bat/>

Little Brown Myotis (Little Brown Bat) – <http://mdc.mo.gov/discover-nature/field-guide/little-brown-myotis-little-brown-bat>

A Little Brown Bat Story – IslandPort Press – <http://www.islandportpress.com/a-little-brown-bat-story.html>



The Forest of Beatrice, the Little Brown Bat

Billy was unusually excited to do his homework assignment. His teacher wanted the class to visit a place near their home or school with lots of trees. Each student was to go to the site and find out what kinds of things live there. Billy went down the street from his house to a county park with a small patch of woods. He had seen a squirrel there the day before, so he thought for sure he would find some cool animals. He walked around for a while, but he didn't see anything interesting,

"What am I going to write about for this assignment? There's nothing here!" Billy wondered. Frustrated and tired, he plopped down on the ground and closed his eyes to think. But, soon, Billy was fast asleep.....

"So, you don't think anything cool lives in these woods?" he heard a high-pitched, squeaky voice ask.

"What? Who's there?" Billy asked in surprise as he looked around him. The sky had turned darker and it was a little hard to see. Billy was sure that there was nobody there. Then he looked up and saw a creature peeking out from a hole in a nearby tree. It was small and brown. And, it was hanging upside down!

"What are you? Who are you?" Billy asked the mysterious creature. He was a little in shock.

"Everyone calls me Beatrice," she answered, "I'm a bat—a little brown bat. A lot of us creatures heard you talking. We are a little upset that you don't even know we exist. So, I'm going to show you all the interesting stuff that lives in these woods. Now, grab my thumb and be sure to hold on tight."

He wasn't about to say "no" to a talking bat, so Billy obeyed her orders and held onto Beatrice's little thumb. There was a flash and he found himself next to Beatrice, looking her right in the eyes. Then he realized that he was hanging from his feet and was covered in warm, dark fur. He had turned into a bat!

"You sure look different," Beatrice said. "It is time for you to use those wings so we can get going!"

Billy was really nervous, but he slowly let go of his feet and began to flap his wings. "I'm flying, Beatrice! I am actually flying!" screamed Billy.

"Great job, Billy," Beatrice shouted back. "Bats are the only mammals that can truly fly and it is a great way to travel around. Now, follow me."

Billy followed Beatrice through the forest, stretching his wings and darting between the trees. He could see rabbits hopping across the ground and he saw a raccoon climbing up a tree. Billy and Beatrice flew over a small stream where he noticed fish silently swimming below the surface of the water. Billy had never flown before and his arms were getting tired. Beatrice slowed down as they flew next to a standing dead tree in the middle of the woods.

"We're here!" she yelled.

Flying low to the ground, Billy heard a rumbling sound. Suddenly heads poked out of the ground! They were earthworms!

“Do you all live under the ground? How do you live? What do you eat?” Billy asked. He had so many questions!

“Well, you could say we eat our way through the soil!” replied one particularly large earthworm. “We make tunnels by eating the dirt and then separating out bits of plants and other food from the dirt. It’s not for everyone, but we love it!”

The other worms nodded in agreement. Billy thought about all this while Beatrice thanked the earthworms for coming.

“We have more to see. Let’s fly around the tree!” she said.

They flew along the trunk of the dead tree. A lot of it was covered with green moss.

“Take a look at everything,” said Beatrice, “Do you see that orange fungus and that lichen growing on the tree? There is even a tree sapling growing right next to it!”

“Woah,” said Billy, “those are so cool! Can we check out the inside?”

“Of course! This tree is my summer home!” said Beatrice as they entered into a crack at the bottom of the tree’s trunk.

Billy was overwhelmed by the amount of activity going on inside the tree. There were ants and beetles scurrying past him. Pill bugs rolled into tight little balls as he flew by.

Beatrice said, “They’re part of the demolition crew. They’re all busy taking apart the tree. Even after a tree dies, it is used by a lot of critters. Sometimes, the tree stays standing for several years, but sometimes it falls down much more quickly. Do you see all of the creatures living in here that you didn’t see before?”

Beatrice helped Billy fly back out of the tree’s crack and up into a hole near the top of the dead tree. “Do you see that?” Beatrice asked. “This tree is also home to birds that like to build their nests in its holes. There is a nice little family of tree swallows that moved in this spring. They are nice and quiet right now. But, they sure make a lot of noise in the morning when I am trying to sleep. And, they live right above me!”

As Billy and Beatrice poked their head out of the hole, Beatrice pointed up into the night sky, “See all those insects? There are moths, flies, mosquitoes, and even beetles. Those are the things that we hunt when we are ready for dinner. Insects are so delicious!”

Billy had never thought of bugs as delicious, so he just smiled at Beatrice.

“What?” asked Beatrice. “You don’t like insects?”

“Not really,” said Billy. “But, I guess I am really glad that you like to eat them.”

“What’s not to like? They are crunchy on the outside and juicy on the inside. Yummy!” said Beatrice.

Beatrice and Billy left the hole and flew back down the tree towards the middle of its trunk. There, they crawled into a much smaller cavity in the tree. "This is my room! It's warm and cozy, right?" said Beatrice.

"Sure thing," said Billy. "But, what is that noise that I hear?"

"Oh, that is just the rest of my friends. There are a dozen bats like me living in this space and they are all about to have babies. In fact, I will give birth to my baby bat very soon!" said Beatrice.

"Babies," said Billy. "I didn't know that bats have babies."

"Of course we have babies," said Beatrice as she laughed. "We are mammals just like you. We usually only have one baby a year. Every now and then someone will have twins, but that doesn't happen very often. We call our babies pups. Come with me and I'll show you."

Billy and Beatrice crawled a little deeper into the hole until they came to a very strange sight.

"What is that?" asked Billy. "It doesn't have any hair and it looks so helpless."

"That's a newborn bat pup," said Beatrice. "She was born just a few hours ago and her eyes are still closed."

"But, how will she catch insects?" asked Billy.

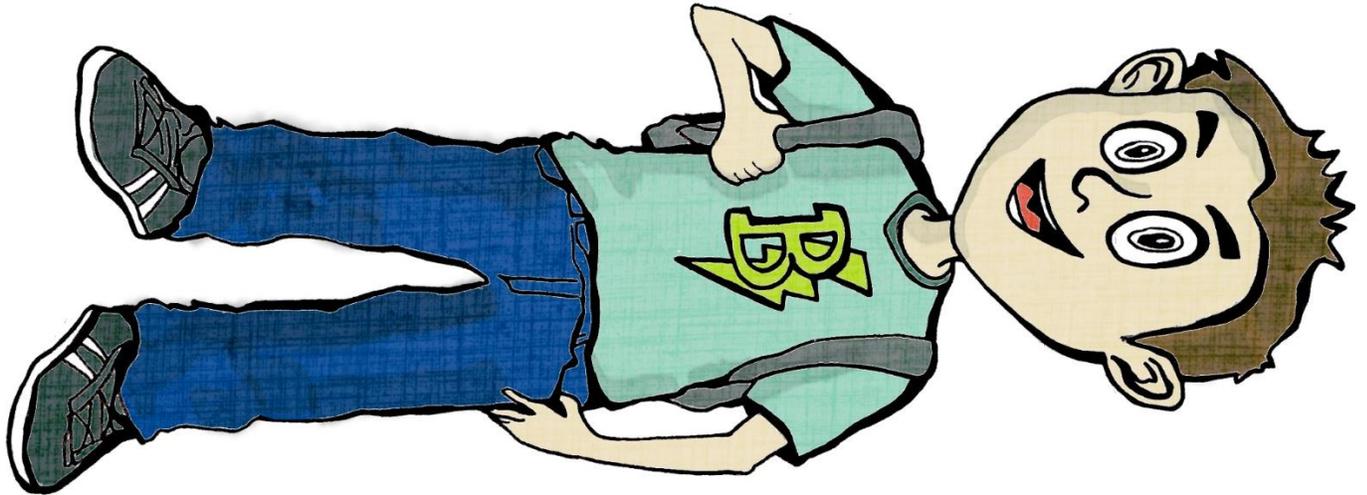
"Just like your mom gave you milk when you were a baby, she will get milk from her mama," said Beatrice. "In fact, it looks like it is time for her to eat, so we better leave them alone."

Billy closed his eyes for just a minute and took a very deep breath. Suddenly, he smelled dirt...

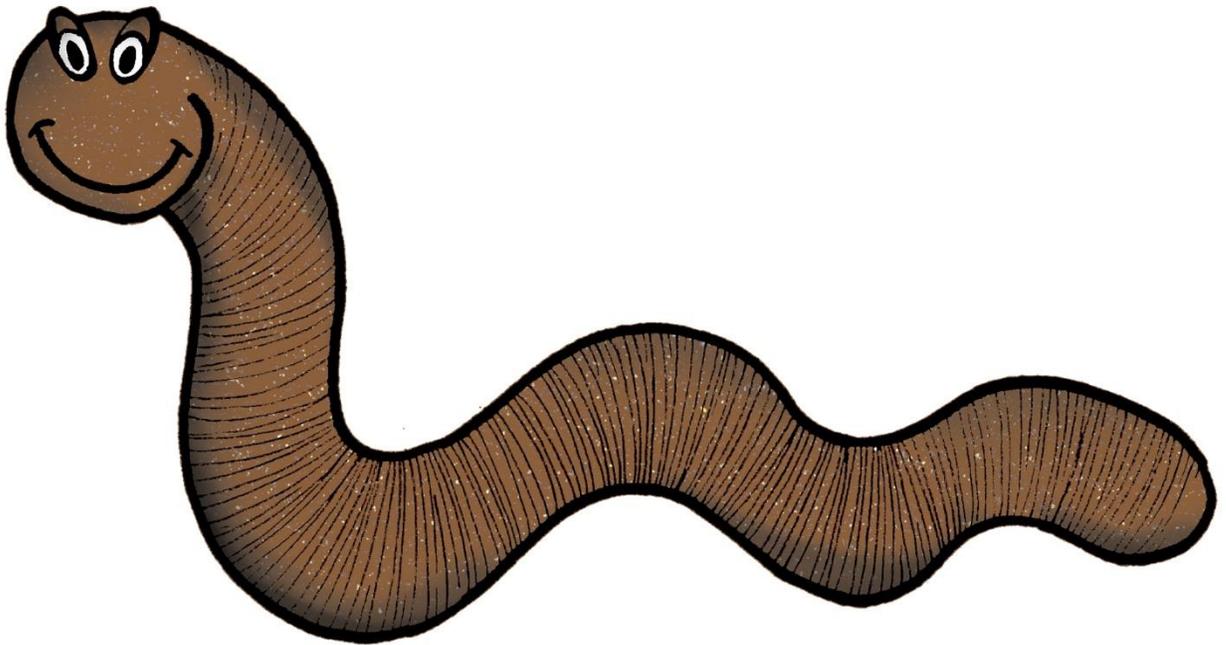
He opened his eyes. He was on the ground again, but instead of sitting he was laying down on his back with his feet in the air. There were leaves of many colors and shapes all around his head. Slowly, Billy sat up.

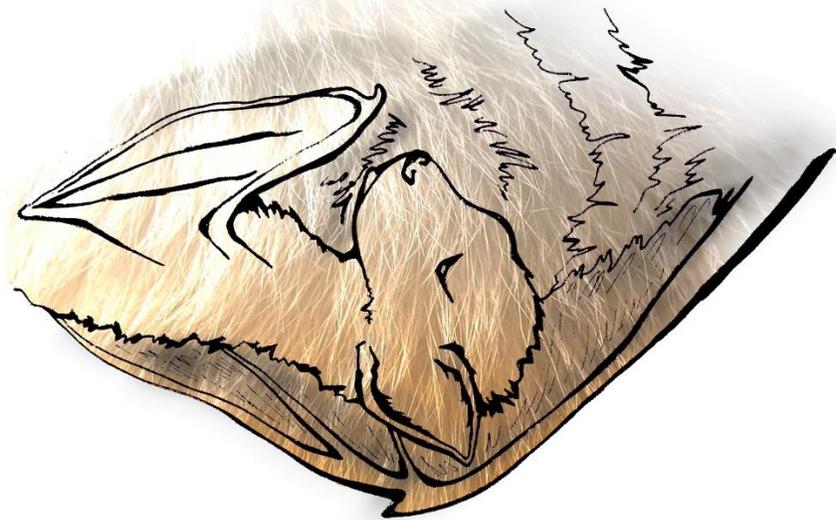
"Did I dream the whole thing?" he wondered as he looked around, "There's a big dead tree over there like the one I looked at with Beatrice!" He stood up and thought that the adventure seemed impossible. Then he saw a small bat hanging from the leaves in the tree. He laughed out loud, "Wow, I have a lot to write about for homework! I can't wait to tell my friends about what I have seen." Then he ran back to his house and got to work.

The Forest of Beatrice, the Little Brown Bat Illustrations



Larger Images Available at: <http://batslive.pwnet.org/edubat/curriculum.php>

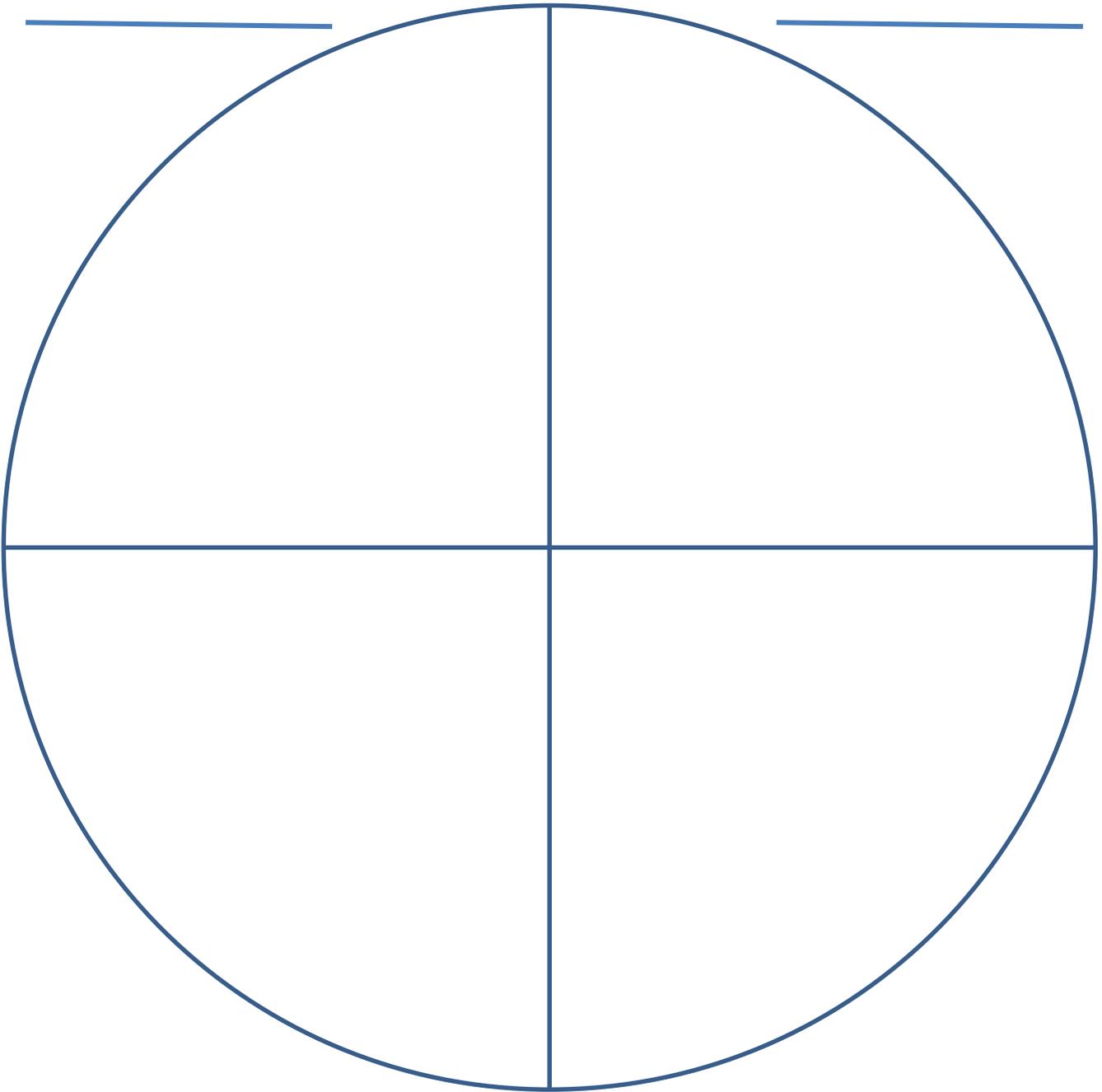




Student Worksheet – Idea Wheel – Little Brown Bat Habitat

Name: _____

Date: _____

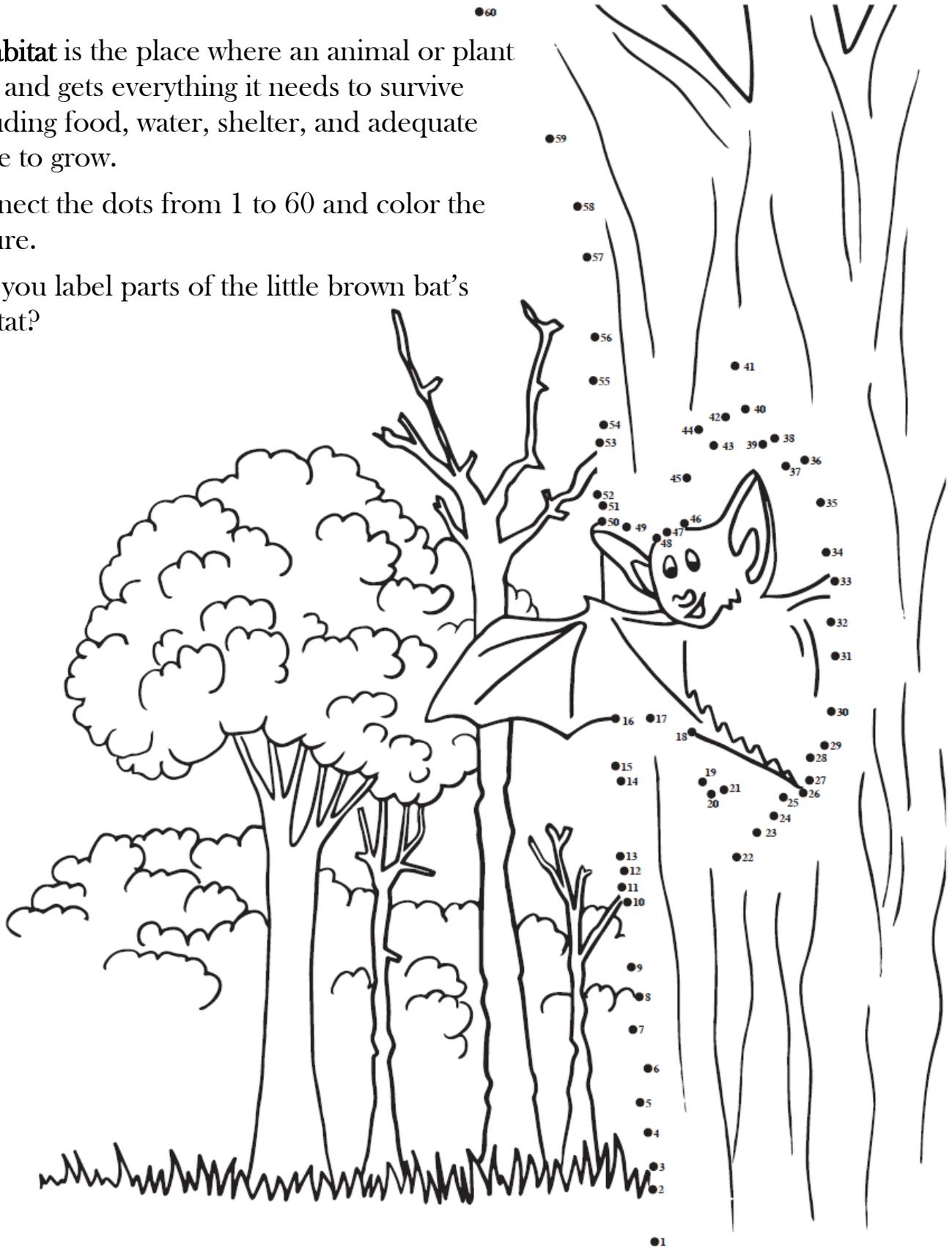


Student Worksheet – Connect the Dots – Little Brown Bat Habitat

A **habitat** is the place where an animal or plant lives and gets everything it needs to survive including food, water, shelter, and adequate space to grow.

Connect the dots from 1 to 60 and color the picture.

Can you label parts of the little brown bat's habitat?





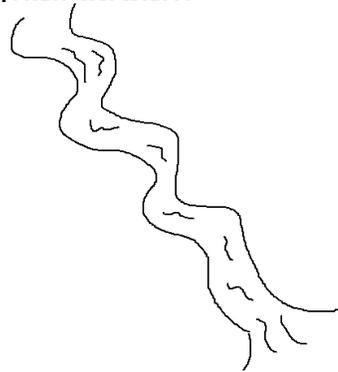
Food

Water

Flying insects (including moths, flies, mosquitoes, and beetles)



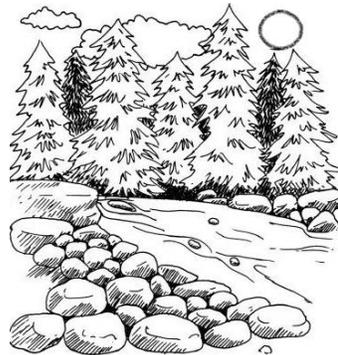
Small stream



Places to sleep and raise their young (called roosts) inside a cavity of a live or dead tree



The whole forest



Shelter

Space to Live

Note to Teachers: students who are familiar with bats might also include places to hibernate during the winter (caves, houses, barns, etc.). However, because this was not part of the story, most students will not include hibernation sites in their drawings.

Curriculum/Standards Connections

Next Generation Science Standards

Elementary School Life Science (Grade 3)

3-LS4-3 Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Common Core State Standards Connections - Reading

CCSS.ELA-LITERACY.RL.3.1

Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

CCSS.ELA-LITERACY.RL.3.2

Recount stories, including fables, folktales, and myths from diverse cultures; determine the central message, lesson, or moral and explain how it is conveyed through key details in the text.

CCSS.ELA-LITERACY.RL.3.3

Describe characters in a story (e.g., their traits, motivations, or feelings) and explain how their actions contribute to the sequence of events