

Summary

Celebrated animal activist and biologist Rob Laidlaw sheds light on bats, from their habits and habitats to their importance for maintaining biodiversity. Bat biology is explored alongside human-bat relations, with facts to fascinate even the most savvy reader. Spotlight features on young “Bat Citizens” make this an empowering book for children seeking their own expressions

of global citizenship. Includes informational sidebars, color photographs, a glossary and index, and a labeled center-gatefold bat illustration.

Rob Laidlaw has devoted his life to protecting animals and empowering others to do the same. He is the founder of several animal protection organizations, including Zoocheck, and an author of many children’s books about animal welfare and activism. *No Shelter Here: Making the World a Kinder Place for Dogs* won the OLA Silver Birch Non-Fiction Award and the Hackmatack Children’s Choice Award; its companion book, *Cat Champions: Caring for our Feline Friends*, was nominated for the same awards. Rob lives in Toronto, Ontario.

Pair this book with:

Books

No Shelter Here: Making the World a Kinder Place for Dogs by Rob Laidlaw

Cat Champions: Caring for our Feline Friends by Rob Laidlaw

Skydiver: Saving the Fastest Bird in the World by Celia Godkin

Online Videos:

Echolocation: <https://www.youtube.com/watch?v=laeE4icRYp4>

Here’s What Bat Echolocation Sounds Like, Slowed Down: <https://www.youtube.com/watch?v=qjOloliWvB8>

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THEMES

Animal Characteristics, Global Citizenship, Biodiversity

BISAC CODES

JNF037020 Juvenile Nonfiction / Science & Nature / Environmental Conservation & Protection

JNF003220 Juvenile Nonfiction / Animals / Animal Welfare

JNF003320 Juvenile Nonfiction / Animals / Nocturnal

JNF007110 Juvenile Nonfiction / Biography & Autobiography / Social Activists

JNF051150 Juvenile Nonfiction / Science & Nature / Zoology

READING LEVEL

Lexile Measure: 1170L | Fountas & Pinnell: R

CURRICULUM CONNECTIONS

Science, Language, Social Studies

THIS GUIDE CONTAINS:

ACTIVITY	MAIN SUBJECT AREA	SPECIFIC SKILLS AND TOPICS
Read-Aloud (including “after-reading” activities)	Reading/Listening Comprehension	<ul style="list-style-type: none"> Recognizing Features of Informational Text
Research Project	Science: Life Systems	<ul style="list-style-type: none"> The Needs and Characteristics of Living Things Growth and Change in Animals (Or Habitats, Biodiversity or Global Citizenship)
Bat Box Building	Science: Structures and Mechanisms	<ul style="list-style-type: none"> Strong and Stable Structures Forces Acting on Structures
Echolocation and Other Bat Sounds	Science: Understanding Matter and Energy	<ul style="list-style-type: none"> Sound
Be a Bat Citizen	Social Studies: People and Environments	<ul style="list-style-type: none"> Global Citizenship

THE READ-ALoud

The initial read will pique students’ interest in bats, paving the way for more in-depth study in the follow-up activities. They will also learn about the features of informational text as a text form. This guide contains prompts that will be appropriate for a range of grade levels. Teachers can skip any that are too simple or too complex for their group.

Learning expectations:

Students will:

- Identify purpose and set goals for specific listening tasks
- Demonstrate an understanding of the ideas and information in oral texts
- Extend understanding by connecting to previous knowledge
- Identify a variety of text features and explain how they help readers understand texts

You Will Need

Bat Citizens

- Chart paper and markers
- “100 Bats” blackline master
- Optional: sticky flags
- Classroom items and tools to measure length and mass
- Map of your region (print or digital)
- Blackline master: Informational Text Features

How To:

Before Reading

Prepare a chart like the one below. You will add to it as you read *Bat Citizens*.

Features of Informational Text

Decide in advance how much of the book you will read each day. There is a lot of information and students will absorb more of it if it's presented in manageable chunks. For young children, one spread each day might be enough. Older students may be able to handle a quarter of the book at one sitting. Show the cover and read the title and author. Ask: Do you think this book is fiction (a story) or non-fiction (information)? What clues are there on the cover?

During Reading

- p. 4 – Read the dedication. Discuss the word advocate.
- p. 5 – Read the heading Table of Contents. Discuss its purpose and read a few of the topics in it. Point out that a table of contents is an important feature of informational text (though some chapter books also have one). Write Table of Contents on the Features of Informational Text chart.
- p. 6–7 – Give students a purpose for listening. Ask them to listen for how big bats can be, and any facts they find interesting. While reading, point out examples of sidebars, headings, and photos with captions, and add these features to the chart. Optional: Use sticky flags to label the features in the book. After reading, see if any students can tell the size and mass of the smallest and largest bats, and ask what else students found interesting. Add “Facts” to the chart of Informational Text Features.
- p. 8–9 – Tell students that, when reading informational text, it is not necessary to read the page in left-to-right, top-to-bottom order. Have them practise using the terms sidebar and caption as they suggest which section they'd like you to read first. You can model this, if necessary, by asking, “Shall I read the ‘Bat Facts’ sidebar first, or the caption on the top photo?” “Shall I read the section about what bats are, or the section about Bat Citizen Truth Muller?” Point out in passing that the headings are important because they tell us what a section will be about. After reading the “Batty Ideas” sidebar, have students touch their throat as they say “Ah”. They should feel a vibration. Then have them touch their throat while they click their tongues. There is no vibration in the throat

because that sound does not come from the larynx.

- p. 10–11 – Read the headings aloud. On this and future pages, invite students to choose a section, sidebar, or caption that interests them, for you to read first. After reading, invite brief discussion. If a student suggests making bat boxes, respond that it sounds like a great idea and write a reminder (e.g. “Let’s make bat boxes”) in a prominent place in the room. You may have planned this activity anyway, but it’s even better if students suggest it.
- p. 12–13 – Listen for: How far can Mexican free-tailed bats fly for their supper? How many bats live in Bracken Cave? After: “\$20.5 million is a lot of money. Where might conservation groups get that kind of money?”
- p. 14–15 – Before: Look at the photo of the bat eating a mealworm. Listen for: What else bats eat.
- p. 16–23 – Ask students to share interesting facts they learned.
- Fold-out: Read the labels and add “Labeled Diagram” to the chart of Informational Text Features.
- p. 26 – Listen for: How do bats help people and the environment?
- p. 28 – Listen for: An example of news stories being inaccurate or misleading. After: Discuss the importance of thinking about news stories critically, checking facts and evaluating sources. What could have happened if Merlin Tuttle’s group had not become involved?
- p. 30–43 – Ask students to share interesting facts they learned.
- p. 44 – Use the list to inspire a “to-do list” for your class. Add “List” to the chart of Informational Text Features. Begin #1 on Laidlaw’s list immediately by pursuing one of the follow-up activities below.
- p. 45 – Visit websites of organizations near you.
- PP. 46–47 Examine the glossary and index, discuss how they help the reader, read a few examples from them, and add Glossary and Index to the chart of Informational Text Features.

AFTER READING

- After p. 6–7 – As a math activity, have students be detectives, searching for classroom items that have the same size and mass as a bumblebee bat, or the same mass as a giant golden-crowned flying fox. They can use a scale to verify the mass. Send them into the broader school with measuring tools to find someone who has an arm span as big as a giant golden-crowned flying fox’s wing span (or as close as possible). Present that person with a flying fox award.
- After p. 8 – View the echolocation videos listed above.
- After p. 9 – See what it means to lose 93% of a population. Give each student a copy of the blackline master “100 bats”. Have them color in 93 of the squares using a black crayon. Point out that, for every group of 100 bats in the caves mentioned, 93 of them had died. Invite them to look at their sheet for a moment to take in the enormity of the loss.
Discuss: It’s easy to feel hopeless in such a situation, but 11-year-old Hope Muller decided to do something about it. As we continue to read about bats, think of ways you can help with bats and other environmental issues.
- After p. 12 – Understand the numbers: 1) On a map (print or digital), locate a community that is 60 miles (100 km) from your own and invite students to imagine traveling to that place every day to find food. Point out that bats do this without motorized transportation. 2) 20,000,000 bats is a really big number. To get a sense of it, have students count or estimate the number of letters on a page of a typical book that they would read (a typical grade one “little book” might have 50 letters on a page, while a grade six chapter book might have 1000). Using this number, and math procedures appropriate to your grade level, help students estimate the number of letters in a book, and then how many books it would take to contain 20,000,000 letters. Then invite them to imagine that every letter in all of those books is a bat. And that all of those bats live in one cave!

- At completion of book: In guided reading lessons, give each student small cards, each bearing the name of a feature of informational text (e.g. glossary, sidebar, labeled diagram, etc.). You may use the blackline master “Informational Text Features”. While reading an informational book together (one copy per student), invite students to place the cards on any features they encounter. See who can be the first to place the “title” card on the cover, the “table of contents” card on the appropriate page, and any other text features that occur. Discuss how these features help the reader understand the text.

ACTIVITY 1: RESEARCH PROJECT

Using a gradual release of responsibility model, teacher and students will collaborate to write and present a research project about bats. Subsequently, students will independently write their own research project on a different topic. By guiding and scaffolding students, it is possible to avoid the heavily plagiarised projects that students so often create. These instructions are for a project focusing on animal needs, characteristics, and behavior, but it can be easily modified to focus on habitats, biodiversity, or global citizenship, and there is ample material in *Bat Citizens* for any of them.

Learning Expectations

Students will:

- Investigate the needs, physical characteristics, behavior, life cycle, and adaptations of different animals
- Gather, sort, and classify information for writing
- Identify and order main ideas and supporting details
- Use a variety of forms (oral, written, graphic) to communicate the results of an investigation

You Will Need

- At least three sources of information about bats, including *Bat Citizens*. The other two should include at least one digital source (e.g. <https://kids.nationalgeographic.com/> , <https://www.pebblego.com>)
- Blackline master “Keyword sheet”

How To:

1. Modeled/Shared Information Gathering. Make a large copy of the keyword sheet on a chart. “I want to share what I have learned about bats. I would like to write down some information and include some pictures. There is a lot of good information in *Bat Citizens*. Should I copy that onto my paper? Why not?...I need to write what I have learned in my own way, but I also need a way to collect the information before I start to write. I’m going to use this keyword sheet.” Thinking aloud, model writing something you already know about bats as a keyword or very short point-form phrase. “I remember that some bats live in caves, so in the habitat section, I’m going to try to write the most important word about that idea... I will write the word caves. I remember that some bats eat fruit. What word should I write about that? Where should I write it?” Continue to fill in the keyword sheet with students’ ideas. Optional: invite students up to do some of the recording. Even if students have not shared all they know about bats yet, proceed to modeling how to record information from a source. Remind students that the project is about bats’ appearance and behavior. Use the Table of Contents to find a page that is likely to have that type of information on it. E.g. Turn to p. 7. Read “Bats are warm-blooded mammals”. Have a student circle “warm-blooded” and “mammal” on the keyword sheet. Read “They have hair on their bodies”. Write “hair” in the body covering section. Read “the females nurse their young with milk from mammary glands.” In the “Babies” section, write “mother’s milk.” On p. 8, read some of the section on echolocation. In the adaptations section, write “echolocation.” Continue reading pertinent sections, listing things like different foods and

habitats in the appropriate spaces. Under “shelter”, you might start with the word “roosts” and then list various roosting places. Not every space needs to be filled in. Even if all spaces are filled in, model consulting at least two more sources to verify the information. Each source that is consulted needs to be recorded on the bibliography. Even young children can learn to make a simple bibliography by writing the book title and author’s name or, in the case of a website, the URL.

2. Guided/Independent Information Gathering. In small, fairly homogenous (in terms of reading skill) groups, provide a selection of non-fiction books about animals at students’ reading level. Have each choose a book. They should each have a different book and study a different animal. Distribute Keyword sheets. Guide them through the same process you followed in the large group, writing keywords for things they already know, reading small portions of the book (usually a sentence) and recording a keyword for each. You could have students take turns reading a sentence aloud and have their peers suggest a keyword and where to record it. Ensure that they do not write an entire phrase from the book. If you see this happen, ask the student to read the book’s sentence aloud. Ask, “What is the sentence about?” “What one word (or 2–3) will best help you remember that information?” If necessary, suggest a keyword for them. Some students will need more help than others, but most will eventually catch on. Once thus guided, most students should be able to continue the task independently. Other students in the class can be reading quietly, drawing pictures of their animal (if already chosen), or be otherwise engaged in quiet, independent activities. Once students are well underway in this task, help them access websites as additional sources (examples are listed above).
3. Modeled/Shared Writing. With the whole class, return to your completed Keyword Sheet on bats. Stress that you will not have your sources open as you do this task, to ensure that you are not tempted to plagiarise.

Model, and then invite students to share in, transforming keywords into sentences and paragraphs. The sophistication of these will vary with your grade level and particular students. As an introduction, suggest they begin with a general statement about the animal and then give its classification. E.g. Simple: "I like bats. Bats are warm-blooded. Bats are mammals." More sophisticated: "Bats are fascinating creatures. They are warm-blooded mammals but a few special adaptations make them unique among mammals." Next, choose which section of the keyword sheet to write about first. Use the label from the keyword sheet as a heading (e.g. Physical Characteristics). Using a think-aloud strategy, find a key word and develop a sentence about it. E.g. "Like other mammals, bats' bodies are covered in hair." The food section is a great place to include the fact that bats are helpful, by dispersing seeds and controlling insects. Ask students to suggest which keyword from the "Physical Characteristics" section to address next, and see if any can compose the next sentence. Continue until that section is exhausted and have a student choose which section to write about next. Write the next heading to show how to leave a blank line between sections, but leave the task unfinished.

4. **Guided/Independent Writing.** Invite small groups to bring their completed Keyword sheets to a table and assist them in beginning to write their draft, just as you did in the large group. If a group of weaker students does not seem ready for this task, take them to your unfinished bat project and model more of it, eventually inviting them to share in the composition. Because you are doing the shared writing with just the small group, they are more likely to be engaged. Then try the guided lesson again. Continue guiding groups until they can proceed independently. On your own time, rewrite and finish the bat project on paper the same as students are using. You will use this to model the visual presentation.
5. **Editing.** Use a familiar format to have students edit their drafts (e.g. individual conference, peer editing, self-editing with a familiar checklist)

and rewrite/type if appropriate. For very young students, the teacher can type the projects.

6. **Modeled/Shared Graphic Presentation.** With the whole class, demonstrate how to cut the project into sections, including the bibliography, and mount each one on construction paper, trimming the edges so that a frame of color is showing. Do the same with any drawings. Demonstrate how to make a title block and the student's name using bubble letters, stencils, or computer-made letters. Demonstrate how to make decorative embellishments such as bat silhouettes. Finally, demonstrate laying everything out on mounting paper such as Bristol board and moving things around until a visually pleasing arrangement is achieved before gluing in place. If the technology is available, you may prefer to model creating a slide show or other digital presentation form.
7. **Independent/Guided Graphic Presentation.** Most students will be able to do the graphic presentation without small group guidance, but if you notice any students struggling with the task, pull a small group aside and guide them through it.
8. **Modeled/Shared Oral Presentation.** With students, develop a checklist of criteria for a successful oral presentation. Model presenting small bits of the bat project in both successful and unsuccessful ways (e.g. making eye contact vs. reading the project with nose buried in the paper; talking knowledgeably vs. reading haltingly). Have students evaluate your success. Have volunteers come forward and do the same.
9. **Independent Oral Presentation.** Have students present their projects to the class and evaluate using the checklist of criteria you developed. You may also wish to evaluate their graphic presentation and actual writing for assessment in a variety of subjects.

ACTIVITY 2: BAT BOX BUILDING

Students will research and learn how to make bat boxes.

Learning Expectations

Students will:

- build a strong and stable structure that serves a purpose
- build and test a structure that will withstand the application of an external force

You Will Need

- *Bat Citizens*
- Internet access
- Wood (pre-cut)
- Glue or caulking
- Screws
- screwdrivers
- Safety glasses

How To:

1. Re-read pages 11, 27, 33, and 44. If your students are studying “Forces acting on Structures,” pay particular attention to page 33.
2. Research: What kind of bats live in our area? What size bat box do they prefer? Where could we hang a bat box? Do we need a permit?
3. Have students look for a variety of bat box plans online. They can Google “build bat house” or “build bat box”. Here are some: <http://www.batcon.org/resources/getting-involved/bat-houses/build> , <https://www.canadianwoodworking.com/plans-projects/build-bat-house> , <http://www.diynetwork.com/how-to/outdoors/gardening/how-to-build-a-bat-house>
4. Together, decide on a bat box design that is appropriate for the bats in your area.
5. Based on your available resources, decide on whether students will make bat boxes individually or in groups, or if you will make one as a class. Ask for donations of materials and volunteers to pre-cut and pre-drill the wood at home and pre-stain interior surfaces. If your school or a nearby high school has a woodworking shop, perhaps it can be done there.
6. On construction day, provide safety glasses, screws, and screwdrivers (plus plastic mesh, staple guns, and galvanized staples, if using) for students and review safety procedures. If your school does not have a woodworking shop, have volunteers work with small groups of students at tables in the classroom or outdoors. Make sure the volunteers are familiar with the plans ahead of time and have some woodworking experience. Volunteers can apply the latex caulking (if using). Students can screw the wood pieces in place using a screwdriver. They may tire easily. Small groups will allow them to take turns. The volunteer can finish the screws with a drill if necessary.
7. Have students research appropriate color for your area. You may use this map <http://www.batcon.org/resources/getting-involved/bat-houses/build> . Have volunteers paint the boxes at home and add roofing material if the students did not do so.
8. Based on the box capacity and weight of typical bats in your area, have students test the bat boxes to ensure they can withstand the anticipated weight. This can be done in the classroom by temporarily mounting the box to a short 4x4 post, which a student can hold upright, while another student drapes over it two plastic bags joined together and filled with weights.
9. Send individual bat boxes home with mounting instructions. If you did not make one bat box per student, plan to mount them at or near the school. If this is not possible, donate them to a local conservation organization that has a good location. Or, have families submit requests for a bat box if they have a suitable location.
10. Alternately, construct just one bat box as a demonstration and send home plans for students to build them with help from their caregivers, as an optional project. Be sure to invite them to bring them in to show the class before mounting.

ACTIVITY 4: ECHOLOCAION AND OTHER BAT SOUNDS

Students will learn about sound through print, video, and hands-on application.

Learning Expectations

Students will:

- Investigate the basic properties of sound
- Investigate applications of the properties of sound (e.g. by animals)

You Will Need

- *Bat Citizens*
- notepaper
- internet access
- glass bowl
- clingy plastic food wrap
- salt
- mobile devices

How To:

1. Give students notepaper and a purpose for listening: In point form, record ways in which bats use sound or are affected by sound, and how humans use the properties of sound to study bats. In *Bat Citizens*, re-read the relevant parts of pages 8, 15, 16, 19, 21, 32, 35, 36, 37, and 38. Have students share some of the facts they recorded, re-stating their point-form notes into complete sentences.
2. Repeat step 1 while viewing videos on echolocation, such as “Echolocation”: <https://www.youtube.com/watch?v=laeE4icRYp4> and “Here’s What Bat Echolocation Sounds Like, Slowed Down”: <https://www.youtube.com/watch?v=qjOloliWvB8>
3. Compare the echolocation of microbats and megabats: Have students touch their throat as they say “Ah”. They should feel a vibration. They are feeling the vibration from their larynx, where microbats produce their echolocation sounds. Then have them touch their throat while they click

their tongues (the way some megabats echolocate). There is no vibration in the throat because that sound does not come from the larynx. But there must be a vibration, because it makes a sound.

4. Investigate: how can we detect the vibration from sounds? Represent an eardrum by stretching clingy plastic food wrap tightly over a glass bowl or drinking glass. Sprinkle salt on the surface. Hold a device such as a mobile phone or tablet so that the speaker is about ½ inch (1 cm) above the surface. Play music on the device and watch the salt move as the plastic wrap vibrates. Different frequencies of sound will make the drum vibrate more than others, so experiment until you find a song that makes the salt really dance. Search for other sounds, including bat sounds, online, and see if any have a frequency that will register on your drum. If you have enough devices, let each student make and experiment with their own drum. Another way to “see” sound vibrations is to speak (or click) into a device’s built-in microphone and watch the device’s visual display.



ACTIVITY 5: BE A BAT CITIZEN

An abundance of inspiration is sure to get your class thinking of ways they too can become Bat Citizens.

Learning Expectations

Students will investigate some global issues of political, social, economic, and environmental importance, their impact on the global community, and responses to the issues

You Will Need

- *Bat Citizens*
- Other books about inspiring activism, such as:

Cat Champions: Caring for our Feline Friends by Rob Laidlaw

No Shelter Here: Making the World a kinder place for Dogs by Rob Laidlaw

Skydiver: Saving the Fastest Bird in the World by Celia Godkin

Stories of other young activists such as Ryan Hreljac and Craig Kielburger

How To:

- In *Bat Citizens*, re-read all the sections that highlight “Bat Citizens” (pages 9, 11, 14, 19, 23, 27, 29, 32, 37, 40, and 41). Discuss the ways in which these young people took action, even though they were quite young.
- Share more inspiring stories through other sources. For example:
 - Read about other animal helpers in two other books by Rob Laidlaw —*Cat Champions* and *No Shelter Here*.
 - Read about how the peregrine falcon was brought back from alarming decline in *Skydiver: Saving the Fastest Bird in the World* by Celia Godkin
 - Read stories of other young people who became activists at a young age and founded international aid organizations (e.g. Ryan Hreljac in *Ryan and Jimmy: And the Well in Africa that Brought Them Together* by Herb Shoveller; Craig Kielburger at <https://www.we.org/we-movement/our-founders/craig/>).
- Read “14 Ways You Can Help Bats” on page 44. Decide which project(s) your class will undertake and make a plan to do so.

BIBLIOGRAPHY

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<http://www.edu.gov.on.ca/eng/curriculum/elementary/language18currb.pdf>

<http://www.edu.gov.on.ca/eng/curriculum/elementary/sshg18curr2013.pdf>

Name _____

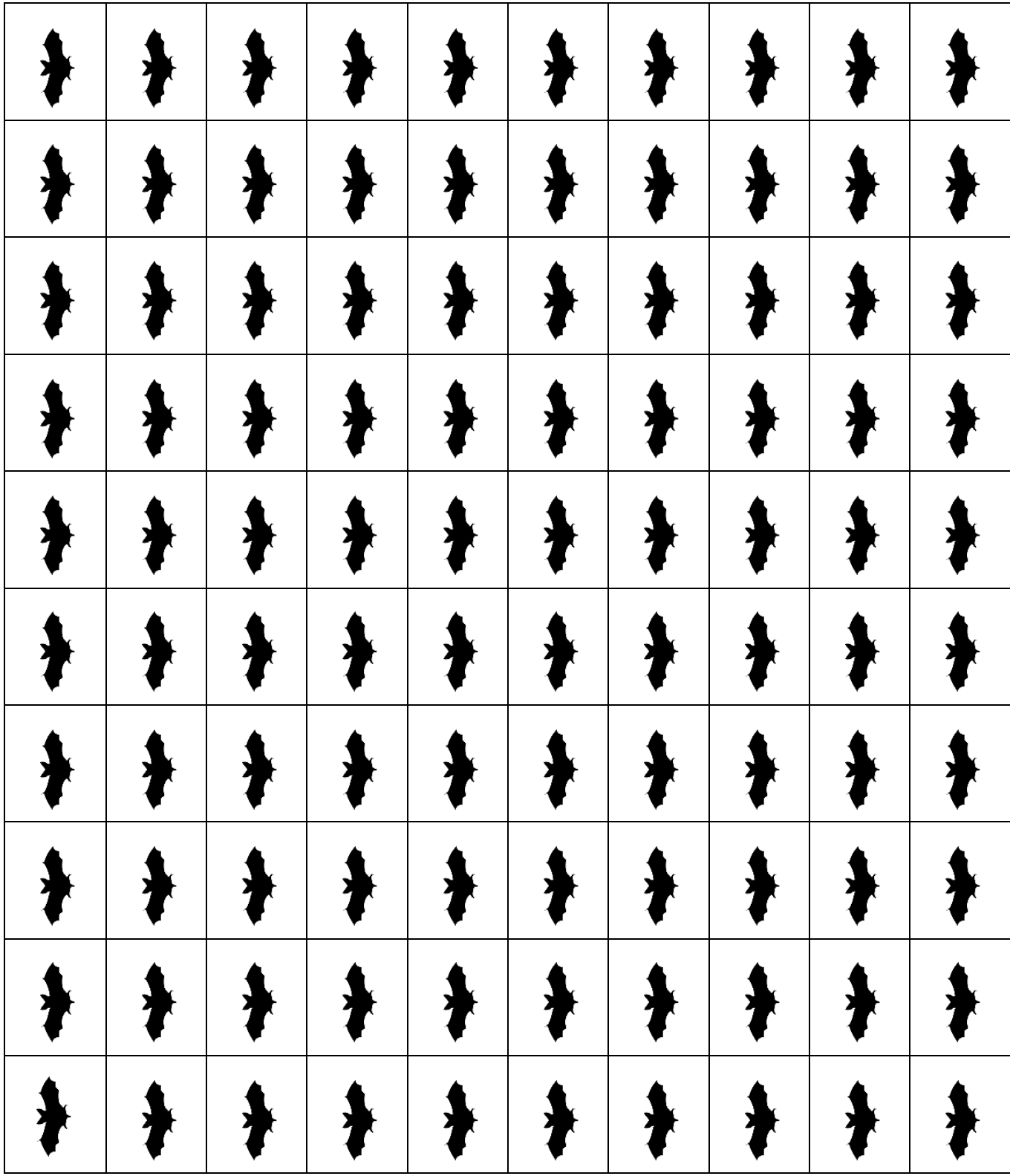


Table of Contents	Heading	Sidebar
Photo with Caption	List	Glossary
Index	Fact	Map
Chart	Labelled Diagram	Sub-heading
Time-line	Bold Print	Title

Keyword Sheet

Animal: _____ Name: _____

Classification

Warm-blooded cold-blooded

mammal fish reptile bird amphibian invertebrate

Physical Characteristics

Size _____

Color _____

Body Covering _____

Eyes _____ Ears _____ Nose _____

Mouth _____ Tongue _____ Teeth _____

Legs _____ Tail _____ Other _____

Life Cycle

Babies _____

Later Changes _____

Adaptations

Behaviour

Needs

Food _____

Water _____

Breathing _____

Habitat _____

Shelter _____

Bibliography

1. _____

2. _____

3. _____