



THE LITTLE BROWN BAT

Teacher's Guide

Responding to
the Grade Two
Science Curriculum

THE LITTLE BROWN BAT

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THE LITTLE BROWN BAT

An Education Resource Unit

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A very heartfelt thank-you to Jim Gow who designed the bat box plans and constructed several sample boxes.

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Teacher Introduction

This education resource unit on the little brown bat was developed for two reasons. The first is that the bat has generally been given a bad name as people developed fears based on myths. The second reason is that the habitat of bats in general is being impacted by human development.

The little brown bat was selected as the focus of this resource because it is found commonly throughout the world including Alberta. The little brown bat is an insect-eating bat and, as such is more representative of the bat world than either fruit eating or vampire bats.

The unit of work was developed in response to discussions with participants at the Alberta Teachers' Association Science Council annual conference in 1998.

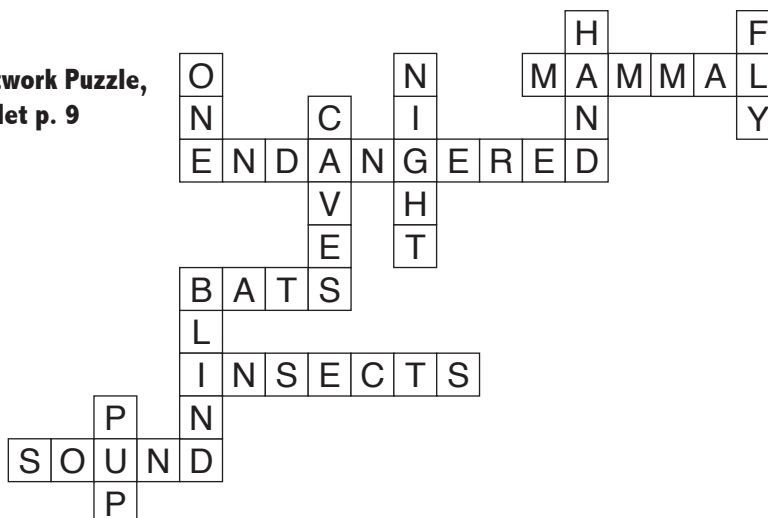
The subject of bats supports topic E of grade two science; small crawling and flying animals. This unit consists of six lessons and a bat story that the teacher and students follow together. Support materials are provided where possible and a list of suggested reference and reading books are given.

This resource provides an excellent opportunity to involve parents in the classroom activities and help dispel their own fears and misconceptions about bats.

Bat Riddles

- | | |
|--|--------------------------------------|
| 1. Where do bats get their energy? | batteries |
| 2. What do you call a bat on a trapeze? | acrobat |
| 3. What did the bat use to make a cake? | batter |
| 4. Which lessons did the bat take? | baton twirling |
| 5. Where did the bat have to go? | batroom |
| 6. What did the bat need to wear over his pajamas? | bat robe |
| 7. What kind of breath did the bat have? | bat breath |
| 8. What game do baby bats play? | Batty cake |
| 9. What bat knows his ABC's? | Alph abat |
| 10. What position did the bat play on the team? | quarter bat |
| 11. What did the bat say when she was asked to dinner? | No fangs, I just ate. |
| 12. Why do bats squeak? | They need to be oiled. |
| 13. Why did the bat want a job? | He was tired of just hanging around. |
| 14. What do you get if you cross a bat with a woodpecker? | Bat-a-tat-tat! |
| 15. What super hero bat wears a cape and leaps tall buildings? | Swooperman! |
| 16. Why didn't the bat laugh at the cave joke? | It was too deep for him. |
| 17. What do you call the end of the bat riddles? | Bat's all folks! |

**Answers to Batwork Puzzle,
Student Booklet p. 9**



Build a Simple Bat Box

To build a simple bat box you will need untreated cedar boards rough cut on one side. The rough cut side will be on the inside of the box for the bats to hang on to.

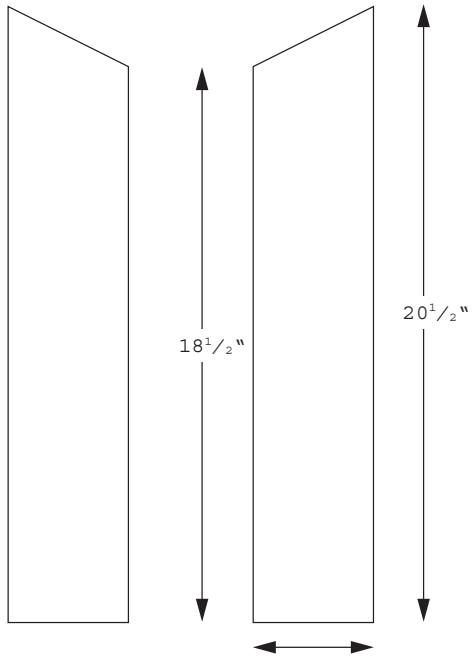
Materials needed for one box:

- one 1" x 8" x 5' cedar board
- one 1" x 4" x 4' cedar board
- 1 1/2" nails (30)
- 1" nails (4)
- one small tube of non-toxic silicon caulk.

Approximate cost: \$9.00 per box.

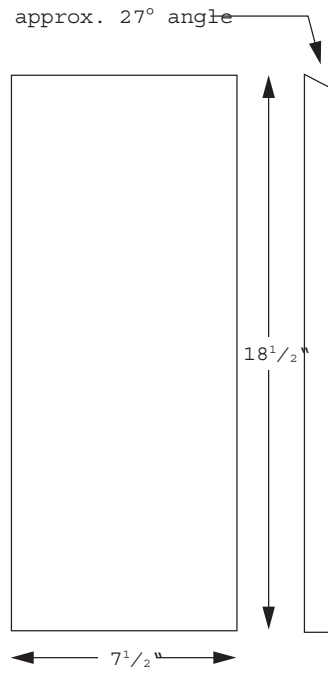
Directions:

- Cut two sides from a four foot length of 1 x 4 board.
- Cut front and back from a five foot length of 1 x 8 board.
- Cut top and ledge from scraps of 1 x 8 board.
- Use 1" nails to attach the ledge to the inside front.
- Use 1 1/2" nails to attach the sides to the front and back.
- Place roof so it is flush with back, and overhangs sides and front by about one inch. Use 1 1/2" nails to attach roof to sides, front and back.
- Use non-toxic silicon caulk to seal all joints from the outside.

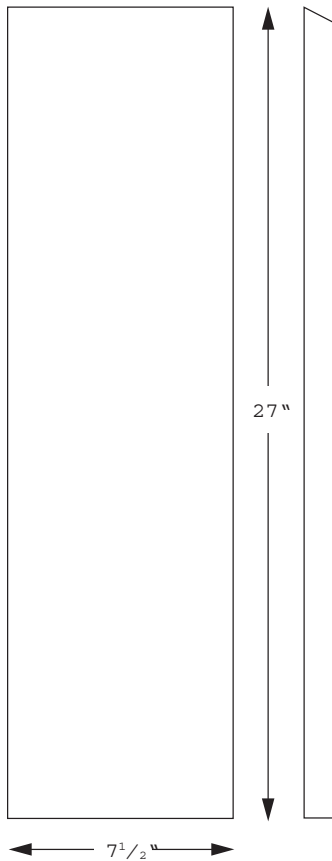


Sides

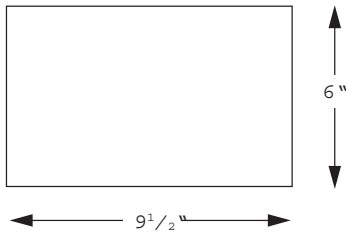
9 1/2"



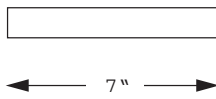
Front Board



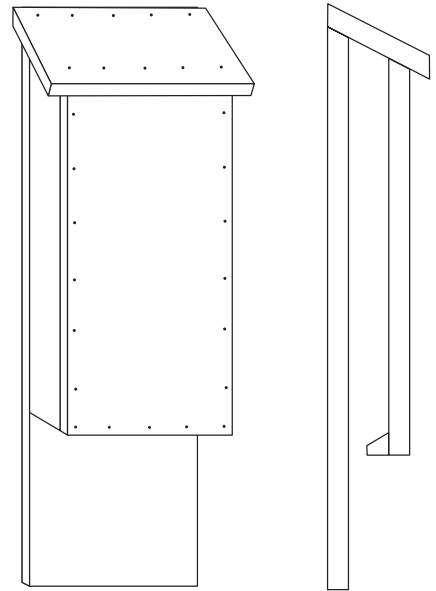
Back Board



Top



Ledge



Front View

Side View

Reading Lists and Supplementary Resources

Suggested Reading List for Teachers and Students

The Science of Living Things **What is a Bat?** by Bobbie Kalman, Crabtree Publishing Company

Let's Read and Find Out Science **Ziping, Zapping, Zooming Bats** by Ann Earle, HarperCollins Publishers

Welcome to the World of Bats by Diane Swanson, Whitecap Books

Bats The Amazing Upside-downers by Phyllis J. Perry, Franklin Watts (Grolier Publishing)

Zoo Books **Bats** by Linda Wood, Monarch Books

A New True Book **Bats** by Susan Gray, Children's Press Chicago

The Magic School Bus **Going Batty - A Book About Bats** by Scholastic

All Aboard Reading **Bats Creatures of the Night** by Joyce Milton, Grosset and Dunlop, Level two, Grades one to three

Stellaluna by Janell Cannon, Harcourt Brace & Company

Little Beaver and The Echo by Amy MacDonald and Sarah Fox-Davies, Walker Books

Suggested Reading List for Teachers

The Wonder Series **Bats Swift Shadows in the Twilight** by Ann C. Cooper, Denver Museum of Natural History and Roberts Rinehart Publishers

Knee High Nature **Fall** by Pat Wishart and Dianne Hayley, Lone Pine Publishers

The Bat House Builders Handbook by Merlin Tuttle and Donna Hensley, Bat Conservation International Inc.

Nighttime Books for Students

Bats and Other Animals of the Night by Joyce Milton, Random House Pictureback

Lets Read and Find Out Science **Where are the Night Animals?** by Mary Ann Fraser, HarperCollins Publishers

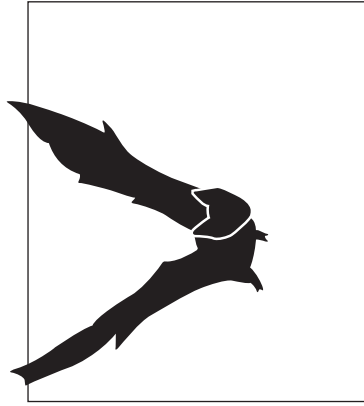
Midnight Mimi by Marie-Louise Gay, Stoddart Publishers



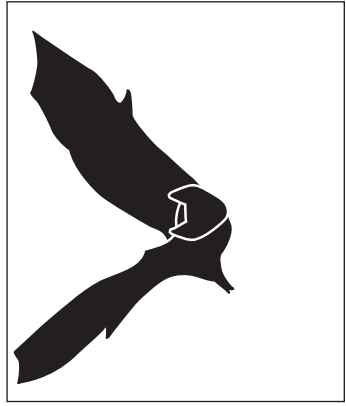
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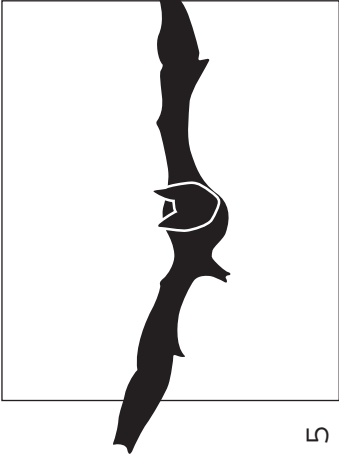
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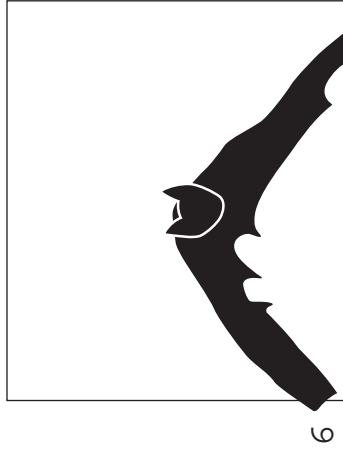
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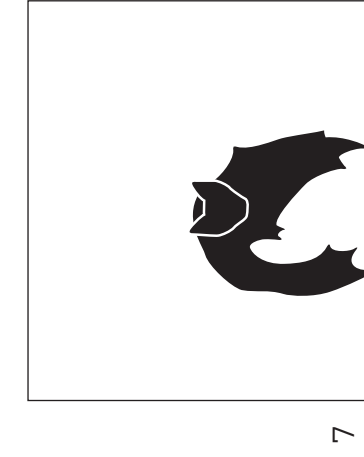
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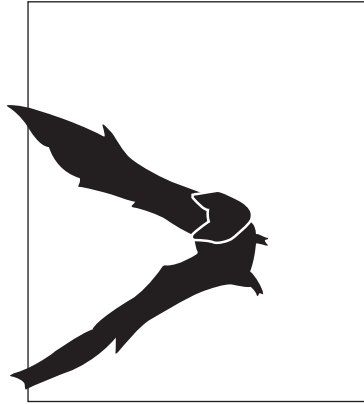
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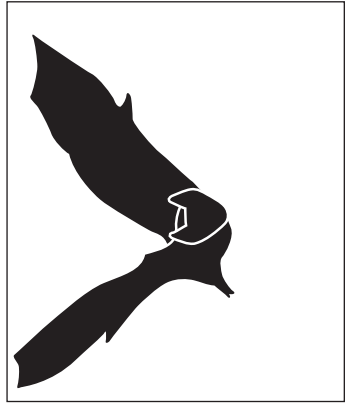
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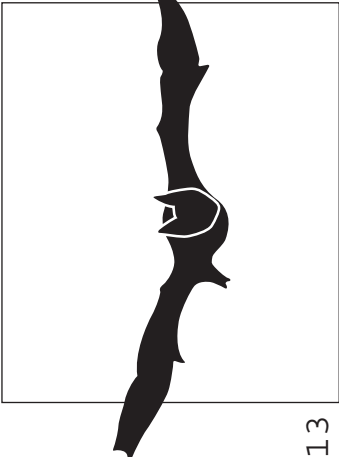
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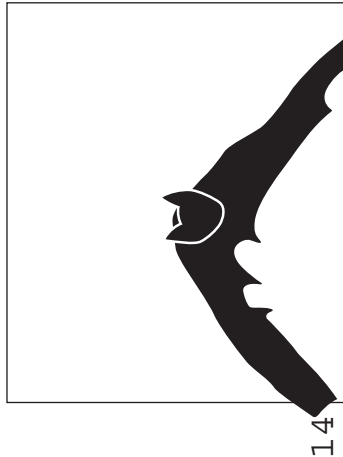
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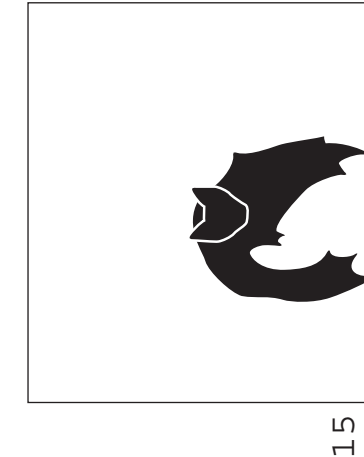
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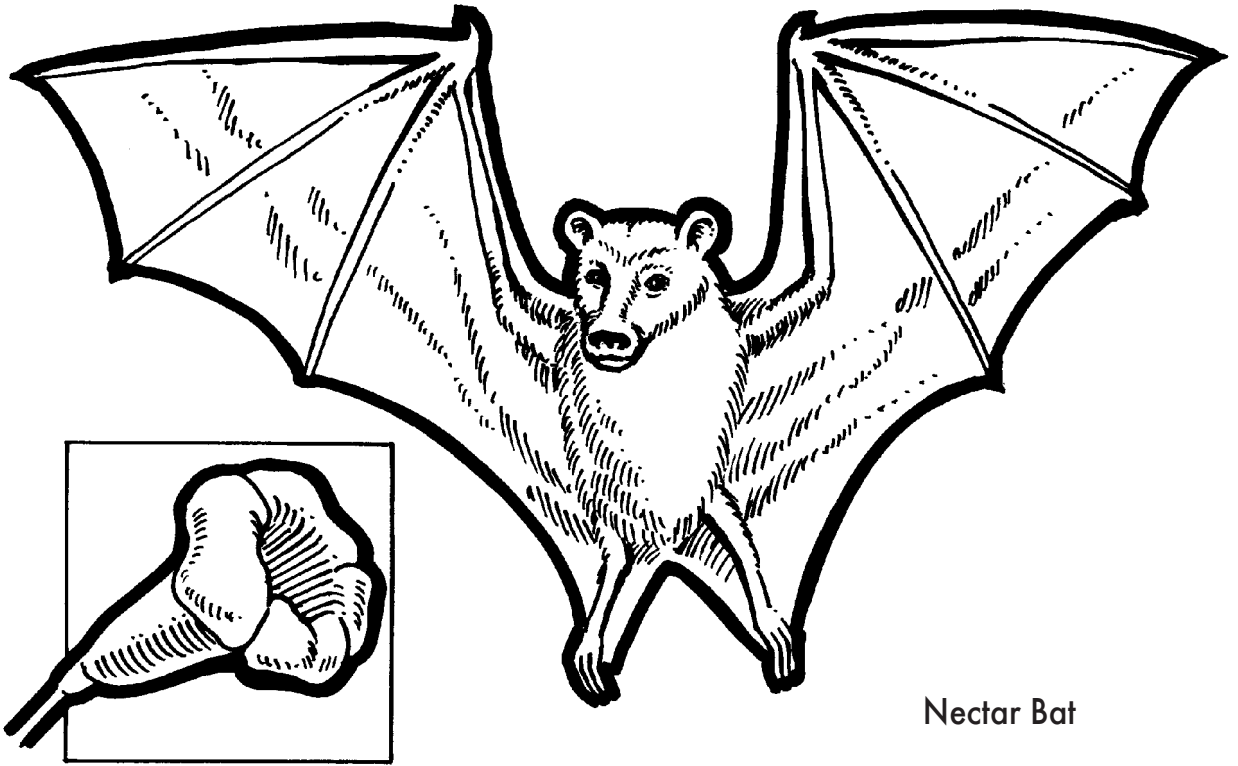
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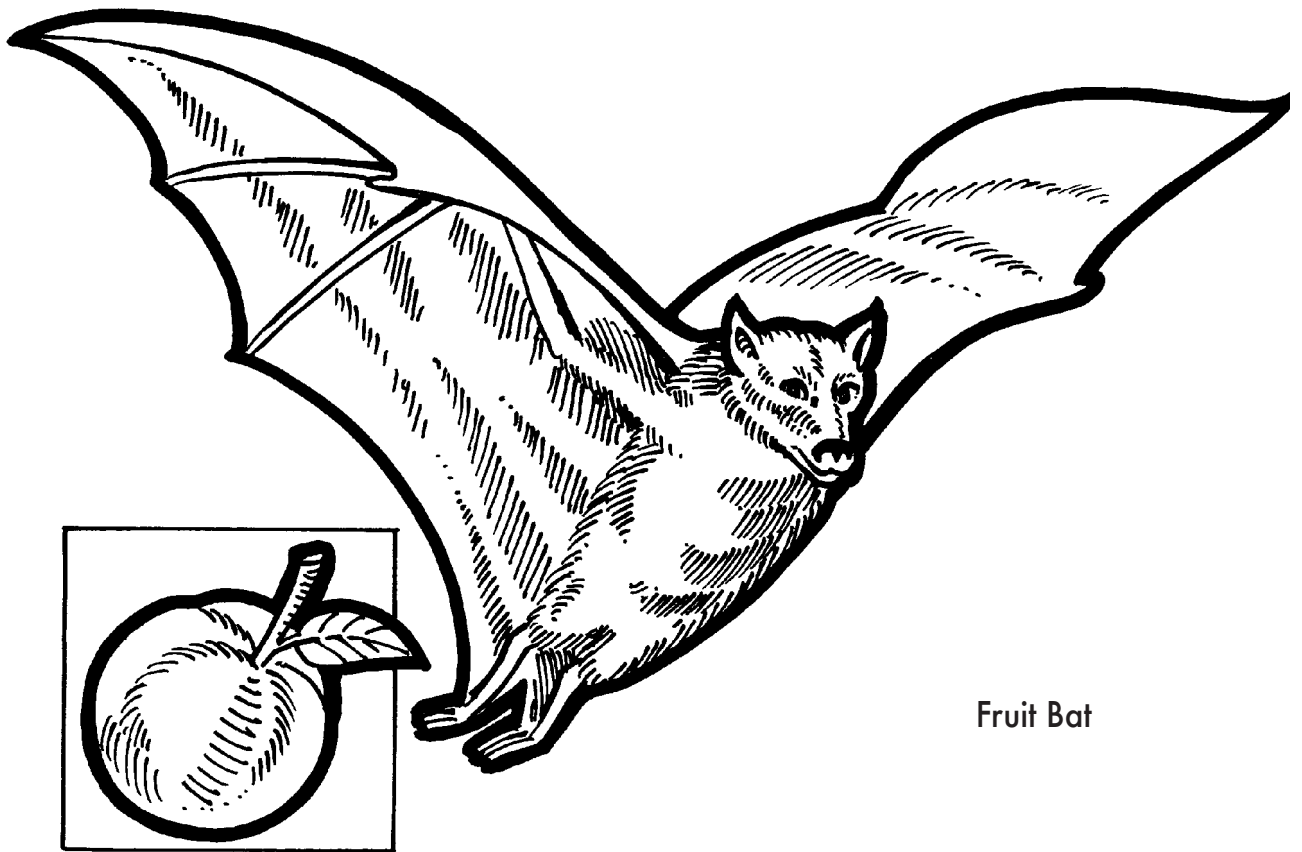
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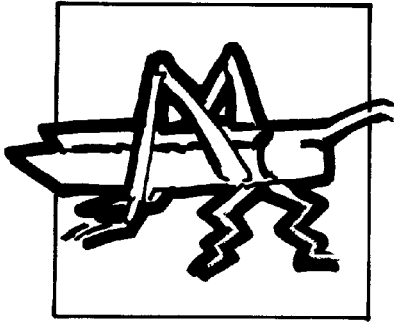
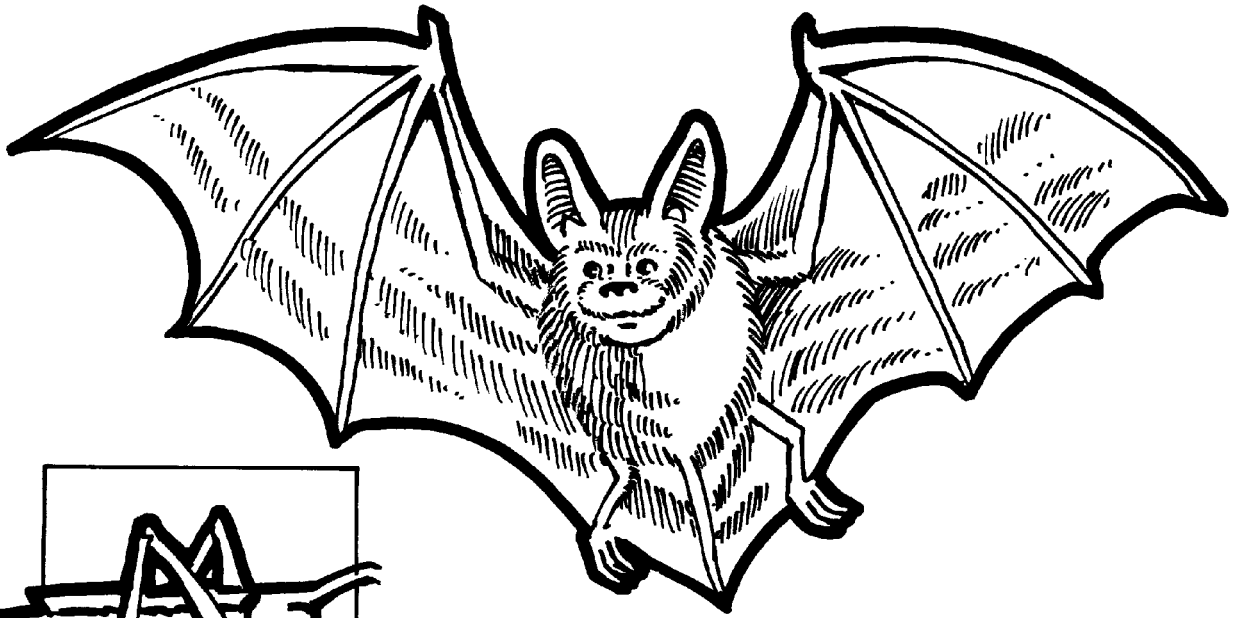
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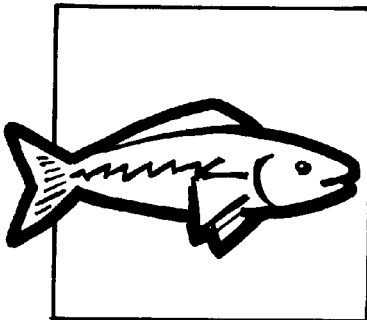
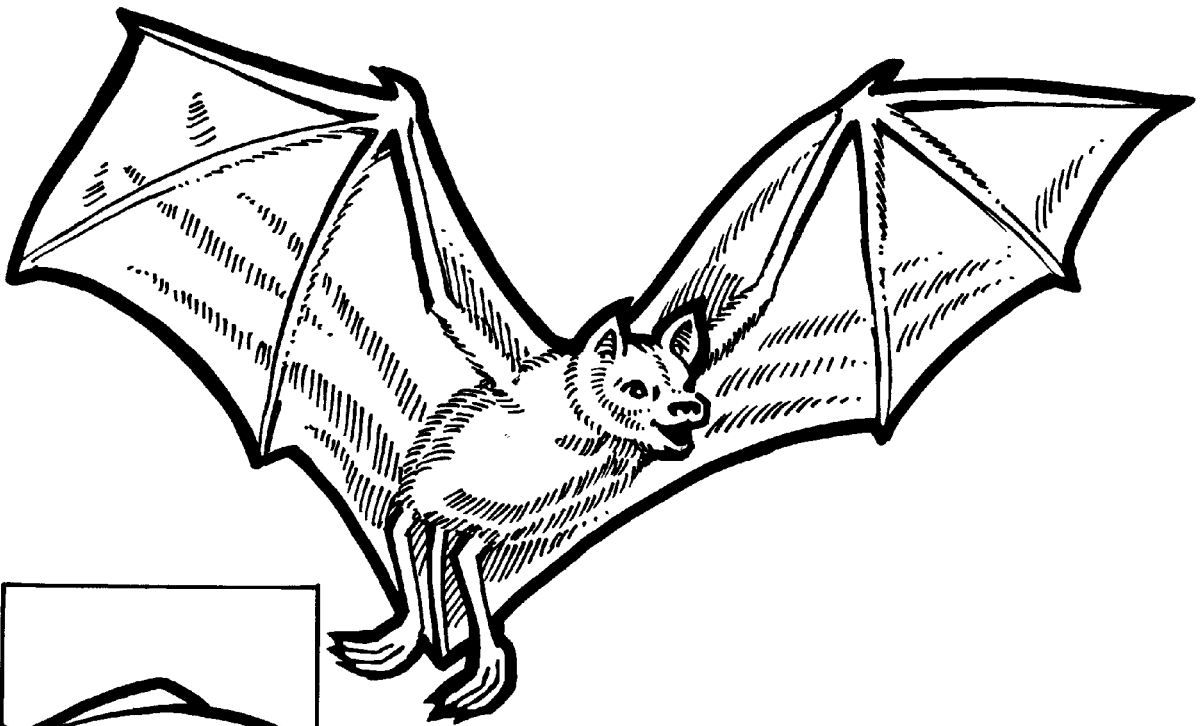
Nectar Bat



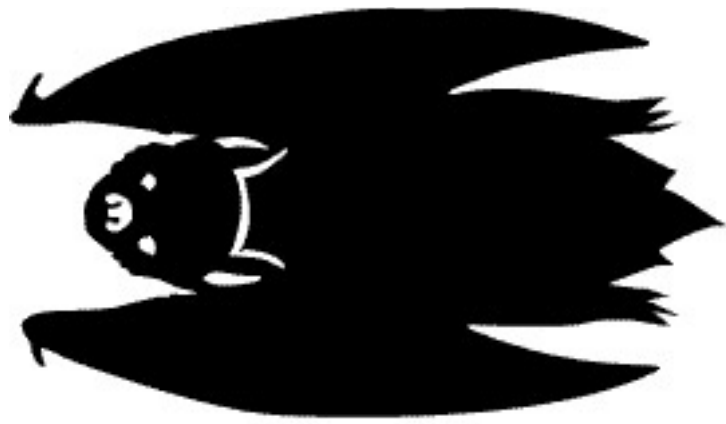
Fruit Bat



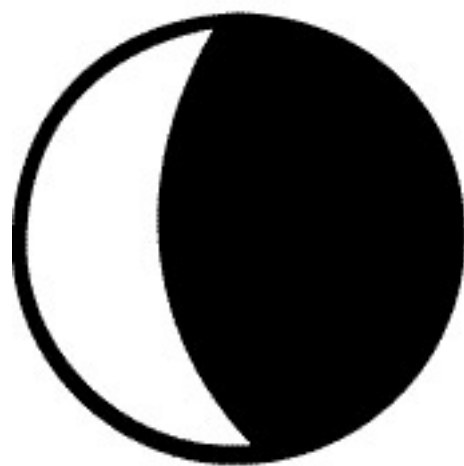
Insect-eating Bat



Fishing Bat







LESSON ONE

Introduction to the Little Brown Bat (*Myotis Lucifungus*)

Curriculum Connection

Science, Grade Two, Topic E: Small Crawling and Flying Animals

Learner Expectation

Students will recognize that there are many different kinds of small crawling and flying animals found locally.

What's that...?

A bat!

And what's a bat?

And if a bat

then what's he at?

Conrad Aitken, Knee High Nature

Teacher Materials and Preparation

1. Use the support material provided in the teacher's guide, to set-up a nighttime wetland display. Copy two bat silhouettes for each student to use in the activities.
2. Title a BAT VOCABULARY board for the bold words in the bat story. Prepare blank word cards.
3. Gather bat-related literature for a reading and reference area.
4. Title a BAT RIDDLE BOARD for daily teacher riddles (in teacher's guide) and student contributions. Prepare blank sentence cards.
5. Title a BATTY FACTS board for facts from the story, students reading and reference material. Prepare blank sentence cards. Hang a map of Alberta nearby for reference.

Procedure

1. Use photos, illustrations and stories to introduce bats as a science topic (avoid confirming or criticizing the students' reactions).
2. Administer the bat attitude test (page one, student booklet) to the students.
3. Read page two of the student booklet, "The Bat Story", with the students.
4. Direct students to count the bat silhouettes in the picture on page two.

5. Assist students to find Wabamun Lake on a map of Alberta.
6. Direct each student to cut-out two or three bat silhouettes given in the display materials. Add these to the night display.
7. Add bat vocabulary (bold words in the story) and new bat facts to the displays.

Enrichment

1. A small group of students could use reference materials to find the names of other Alberta bats and mark possible locations on an Alberta map.
2. During your study of bats, read a chapter-book to the class. One suggestion is **Silver Wing** by Kenneth Oppel.

LESSON TWO

How is a Bat a Bat?

Curriculum Connections

Science, Grade Two, Topic E: Small Crawling and Flying Animals

Learner Expectation

Students will compare and contrast small animals that are found in the local environment.

A bat can hang upside down
It holds on with its toes.
When it wants to find some food
It spreads its wings and goes.

Anonymous

Teacher Material and Preparation

1. Prepare several blank word cards to use for bold words in the bat story and blank sentence cards for new bat facts.
2. Gather items for construction activity:
 - green garbage bags (one for each group of two students)
 - straws (20 for each group)
 - two or three boxes of toothpicks (shared among the groups)
 - an 8 $\frac{1}{2}$ " by 11" piece of brown corrugated cardboard for each group.
3. Use of the Comparison Activity on page seven in the student booklet.

Procedure

1. Read page two of the bat story with the students.
2. Discuss the differences and similarities of a human hand to a bat wing.
3. Using the Comparison Activity in the student booklet, discuss the differences between little brown bats, red-winged blackbirds and dragonflies. A book on birds and insects will provide you with ample information on blackbirds and dragonflies for your preparation. Begin the page with facts known to the students.
4. Add new bat vocabulary and bat facts to the displays.

5. Using the green garbage bags, straws and toothpicks direct pairs of students to construct “bat wings”. Then direct the pairs of students to staple the plastic wings to a “bat body” made from a shaped piece of cardboard. Display the plastic-and-cardboard bats with wings folded or spread.

Enrichment

1. Arrange for pet birds or small pet mammals to visit the classroom. Compare and contrast the body parts of the bat to the visitors.
2. Take the class to the city zoo or local pet store and have a guided tour to discuss animal similarities and differences.

LESSON THREE

Bat Basics

Curriculum Connections

Science, Grade Two, Topic E: Small Crawling and Flying Animals

Learner Expectations

Students will recognize that small animals, like humans, have homes where they meet their basic needs of air, food, water, shelter and space; and describe any special characteristics that help the animal survive in its home.

A bat might live inside a cave
And fly around at night
and when it's dark a bat knows
how to get around all right.

Anonymous

Teacher Material and Preparation

1. Gather blank cards for new vocabulary and bat facts.
2. Bring in a bathroom weigh scale and gather items that will, combined, weigh 50 kilograms.
3. Gather cloth blindfolds for half of the class (for obstructed vision).
4. Set up a refrigerator box as a reading area (bat cave or cottage).
5. Place books on echoes and nighttime animals (skunks, owls, and coyotes) in the reading area.

Procedure

1. Read page four of the bat story, with your students.
2. Use the weigh scales to demonstrate what 50 kilograms might look like in a mass of familiar objects. (Set-up as an activity center.)
3. Add more comparisons to the comparison page in the booklet.
4. Add any new vocabulary and bat facts to the display boards.

5. Try to make echoes in the classroom, then go to the gym to try echoes in a larger room. While in the gym play a bat-mosquito game. Blindfold four or five students as bats (they should be able to see vaguely) and assign the rest of the class as mosquitoes. Set out pylons to represent trees that the bat must avoid. When the bat calls "bat" the mosquitoes must say "mosquito" in return. The bat tries to touch the mosquito as well as avoiding the trees. Caught mosquitoes can take the place of the "bat" that caught them or caught mosquitoes could take the role of bats until there are no mosquitoes left.

Enrichment:

1. Home project: Use one of these discussion questions to write an explanatory report: Why does a bat fly at night? or Where might Alberta bats go in winter?
2. Arrange for the class to go on a night walk to a nearby wetland area. Discover night sounds, smells, sights and temperature changes.
3. Use magazines to find other nighttime animals to put on the display board or to make card games. (Fish, War, Classification)

Teacher Information:

1. Bats eat at nighttime because there is less competition for food.
2. It is believed that Alberta bats hibernate somewhere other than their summer roost. Little brown and long-eared bats go to caves and old mines in Alberta and Montana. Silver-haired and hoary bats migrate to Arizona and New Mexico. Big brown bats move into cities or rural buildings that do not freeze.

LESSON FOUR

What's For Dinner?

Curriculum Connections

Science, Grade Two, Topic E: Small Crawling and Flying Animals

Learner Expectation

Students will identify an animal's role within the food chain (plant eater, animal eater or decomposer); name the animal's predators and give examples of how the animal avoids the predator.

Perhaps he wants a nice fat moth,
On noiseless wings
see how he swoops
in circles, dives and loop-the-loops.

Conrad Aitken, Knee High Nature

Teacher Materials and Preparation

1. Gather blank word and sentence cards for the display.
2. Gather enough Owls of Alberta (Alberta Environment) pamphlets for the class to share.
3. Collect a paper lunch bag for each student and scraps of coloured paper to use to add owl features to the bag.
4. Copy flick and fly pictures, (provided in the support materials), on manila paper, one for each student.

Procedure

1. Read page five of the student booklet with your students.
2. Discuss different kinds of food chains. Two examples are:
sun, green plant, mouse, weasel, and owl
sun, green plant, rabbit, and hawk
3. Direct the students to add arrows to the illustration on page five to show the bat food chain.
4. Using the Owls of Alberta pamphlets direct students to find the great horned owl that hunts in the Wabamun Lake area and draw it in the illustration.
5. Have the class make an owl puppet with the paper bag, resembling the great horned owl.

6. Use the Flick and Fly cards to create a bat avoiding the owl.
7. Add new bat vocabulary and bat facts to the displays.

Enrichment:

1. In the gym or designated outdoor area, play a predator-prey game, with the students.
2. Assign one owl for the center area. Three of the students on one side of the gym are bats and the remainder of the students are mosquitoes on the other side of the gym.
3. The bats and mosquitoes wearing different coloured pinnies will run across the gym when the owl calls "Fly, bats, fly". When bats are caught by the owl they become owls and when mosquitoes are caught by bats they become bats.
4. The game will progress quickly as food sources become depleted. Discussions about what happens to animals when food is scarce will help relate to the science topic.

LESSON FIVE

Little Brown Bats Need Friends!

Time Suggested

Two to three periods

Curriculum Connections

Science, Grade Two, Topic E: Small Crawling and Flying Animals

The baby bat
screamed out in fright
"Turn on the dark,
I'm afraid of the light."

Shel Silverstein

Learner Expectations

Students will describe the relationships of an animal to other living and non-living things in their habitat, and to people.

Teacher Material and Preparations

1. Gather blank word and sentence cards for the display.
2. Collect construction paper for bat posters.
3. Gather items for a role play of the section of the bat story on page six (items in a regular classroom and a rubber or cloth bat).

Procedure A

1. Read page six of the student booklet with the students and discuss possible endings. (This is a true story. The class involved took the bat to other classrooms and set it free in the evening.)
2. Discuss two rules for bat safety and have the students print them under the picture in the booklet:
 - Never touch a bat.
 - Call an adult to remove a grounded bat to a safe place. (Incidents of bat rabies are very low; less than .05% of population in Alberta.)
3. Discuss why a little brown bat would not make a good pet (diet of flying insects).
4. Create a role play about the bat in the classroom with the students.
5. Add new words and bat facts to the display boards.

Procedure B

1. Discuss reasons for bat decline (background information given at the end of the lesson).
2. Record these reasons on the blackboard or sentence cards.
3. Discuss ways we can help little brown bats:
 - don't fear bats
 - leave more wetlands
 - build and erect bat boxes in suitable habitat
4. Direct the students to use the ideas discussed to create a poster titled, Little Brown Bats Need Friends.

Enrichment

Arrange for a parent and child night to build bat boxes. With assistance from parents, board could be pre-cut and assembled. A bat box should be hung in a tree near water, that affords the box maximum daily sunlight.

Teacher Background Information: Bat Decline

1. Ignorance and superstition have caused the greatest decline in the bat population. False myths:
 - bats are blind
 - bats get caught in your hair
 - bats are flying mice
 - all bats feed on blood
 - bats are dirty
 - most bats carry rabies.
2. With the loss of forests and wetlands, bats have lost places to feed, roost and hibernate. Most bats adapt to specific habitats in which they live and find food.
3. Bats have only one baby a year, so it only takes a few disturbances in the nursery caves for the bat population to be reduced. The mothers may drop or abandon their young and move to a new roost.
4. The use of chemicals to control insects reduces the amount of bat food. As well, as bats eat insects covered in toxins, they store the toxin in their fat and when the fat is used during hibernation it can negatively affect or even kill the bat.

LESSON SIX

Bat Watching Around the World!

Time Suggested

Two periods

Curriculum Connection

Science, Grade Two, Topic E: Small Crawling and Flying Animals

Some people are horse fans,
Others love cats,
And some like snakes and their kin.
But I love bats,
With their furry snouts,
And stretched-out wings of skin.

Amazing Animals, Ranger Rick

Learner Expectation

Students will identify ways in which animals are considered helpful or harmful to humans and to the environment.

Teacher Materials and Preparation

1. First session: copy the four illustrations of four different species of bats provided in the support material, one set for each student. Gather heavy thread, hole punches and a coat hanger for each student to make a bat mobile.
2. Gather materials for the second session:
 - large bowl, spoons and small bowls for each student,
 - knives and mixing spoon for each small group.
 - Buy some of these items for the fruit salad: bananas, mangos, dates, peaches, figs, or canned guavas.
 - You will need peach or banana yogurt and chopped cashews and carob chips to sprinkle on the top of the fruit salad.
3. Gather blank sentence and word cards for the displays.

Procedure: First session

1. Read page seven of the student booklet with your students.
2. Use the illustrations from the support material to show the class examples of the bats described. Discuss the different facial features with the students.
3. Direct the students to cut out the bat figures and the illustrations of their food, to construct a bat mobile.

Procedure: Second Session

1. With the class assisting, make a “bat fruit salad”. Cut the chosen items into small pieces and mix in the yogurt. Students can sprinkle on their own cashews and carob chips.
2. While making the salad, take the opportunity to discuss how bats are important to fruits being used in making the fruit salad. Flying foxes pollinate and disperse wild bananas, while figs, carob, peaches, dates and mangos rely on fruit bats for seed dispersal. Leaf-nosed bats disperse the seeds of guavas and cashews.

Enrichment:

1. In China people think that seeing a bat is good luck. A good gift is a lucky charm with a picture of five flying bats. It is considered a sign of happiness, long life, wealth, health and good luck. With this in mind, students could create a gift for a friend by using one of a number of art projects. (E.g., vegetable stamps, clay necklaces or fridge magnets, water colour painting made into a paper fan.) See below for the good luck symbol (wu-fu).

Recipe for art clay: **2c cornstarch**
 4c baking soda
 2 1/2c cold water

Mix ingredients, cook over medium heat stirring constantly. Cook about 10 minutes or until mixture is like mashed potatoes. Put on a plate too cool, then knead gently to smooth. Store in a sealed container until used.

Paint creations with clear nail polish or acrylic sealer to protect.

2. Using a cartoon strip, have the students create a comic about a bat adventure. The strip should have about six scenes.

