

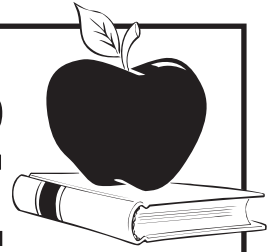
GRADE LEVEL: 4

CORRELATION TO NEXT GENERATION SCIENCE
STANDARDS: 4-LS1-2

SKILLS/PROCESSES: comparison & generalization, grouping, fact finding, creativity, relationships

OBJECTIVE: Students will understand the difference between nocturnal and diurnal behavior among mammals.

TEACHER'S GUIDE



UNIT ONE ■ LESSON THREE

Mammals Night and Day

BACKGROUND

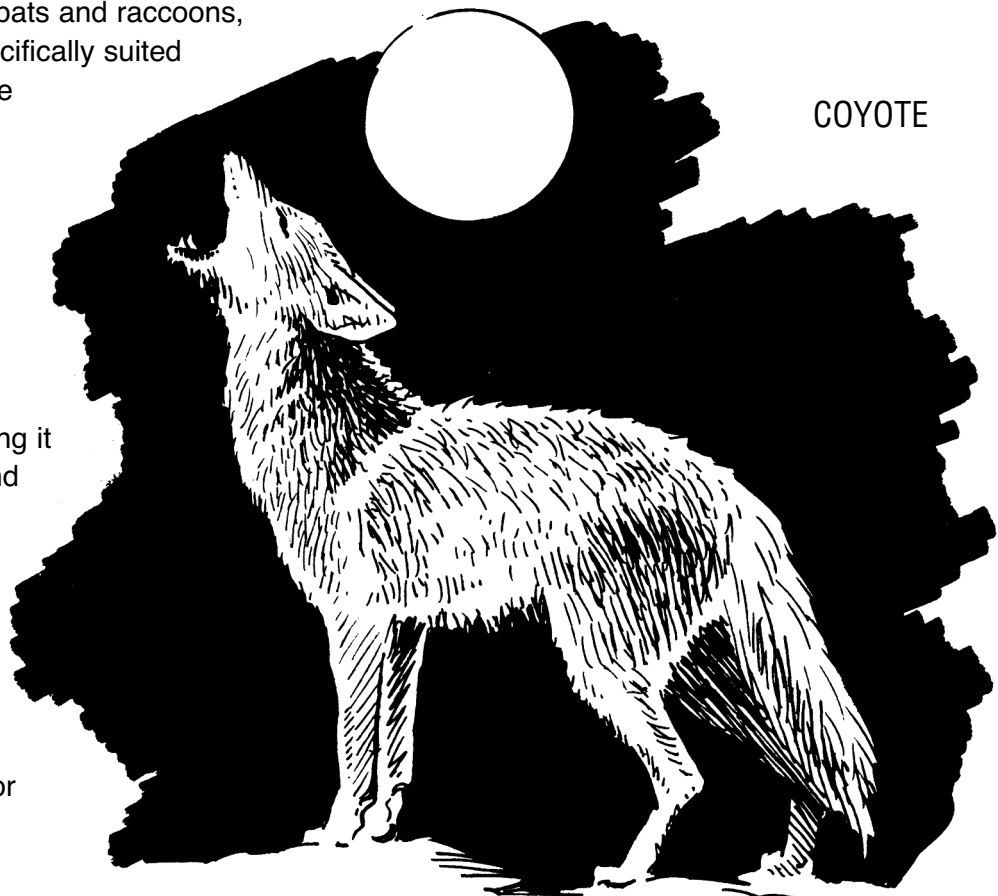
All mammals require some period every day or night for rest and sleep. Whether a mammal sleeps primarily during the day or at night depends on an individual species' particular habits and survival techniques. All mammals adapt to either daytime or nighttime activity.

Those mammals that rest during the day and engage in feeding, mating and other activities at night are called **nocturnal**. Those that rest at night and are active during the day are called **diurnal**.

Nocturnal mammals, like bats and raccoons, have evolved in ways specifically suited to life in the dark. Bats use **echolocation**, a unique system in which their extremely sensitive ears help them navigate through the dark. Most other nocturnal mammals have light-sensitive eyes and darkly colored fur or natural **camouflage** making it difficult for predators to find them. These mammals spend most of the day sleeping in dens or burrows.

Diurnal mammals, like tree squirrels, have evolved beneficial ways for daytime living. Most have developed protective col-

oration or camouflage appropriate to their daytime habitat which makes them less visible to predators. Such mammals' eyes are adapted to bright light, and each mammal has its own special means of escape or protection from predators. For instance, squirrels are very fast and agile, allowing them to outrun or outmaneuver their enemies. Diurnal mammals take their rest at night in dens or burrows.



COYOTE

PROCEDURE AND DISCUSSION

Review the student information with the class. Emphasize the nocturnal versus diurnal behavior and the advantages and disadvantages of each.

1. What characterizes a nocturnal mammal?

A nocturnal mammal is active at night and rests or sleeps during the day.

2. What characterizes a diurnal mammal?

A diurnal mammal is active during the day and rests or sleeps at night.

3. What is echolocation, and what mammal uses it?

Echolocation is a sound-and-hearing technique used by bats to "see" in the dark.

VOCABULARY

camouflage—coloration that blends into the natural background

diurnal—of or occurring during the day

echolocation—a technique of sound and hearing used by certain animals to navigate in the dark

nocturnal—of or occurring during the night

CHALLENGE YOURSELF EVALUATION

1. Nocturnal mammals have eyes that are sensitive to dim light, natural camouflage for night activity or dark fur, sleep in dens or burrows and may use echolocation. Diurnal mammals have eyes that are adapted to bright light, camouflage for daytime activities and have the ability to move quickly.

2. Answers will vary.

3. Echolocation is a system of using sounds to "see" at night. Bats use this system.

ACTIVITY PAGE EVALUATION

Evaluate students based on participation in discussion.

EXTENSION

Many zoos and museums have special exhibits of nocturnal animals in which nighttime conditions are maintained during the day. Visit one of these displays and let the students observe the activity of these animals.

Mammals Night and Day

STUDENT'S GUIDE

Like all animals, mammals must spend part of every day or night resting or sleeping.

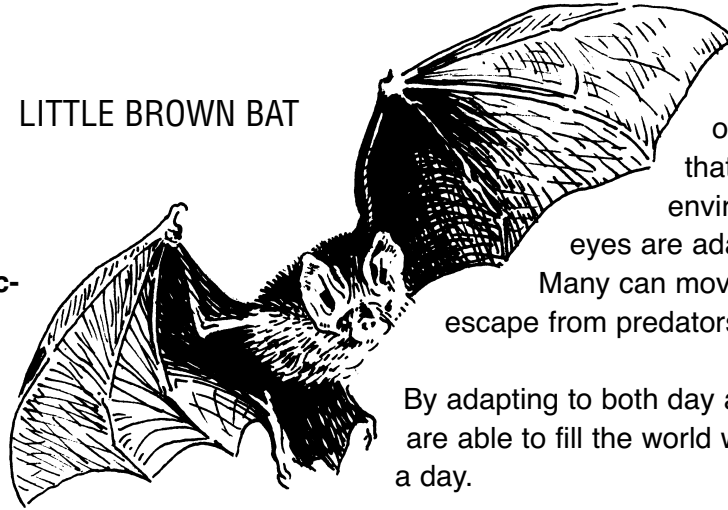
Those mammals that rest during the day and are active at night are called **nocturnal**.

Nocturnal mammals, like bats, raccoons and weasels, have developed many special ways of surviving in the dark. Bats use a sound system called **echolocation** and very sensitive ears to “see” or navigate in the dark. The sounds they make bounce back to them. Their ears pick up the sounds. Their ears send a message to their brain. The brain determines where objects are located based on the sound sent and the sound bounced back. Most nocturnal mammals have eyes which are very sensitive to dim light. They have dark-colored, or naturally **camouflaged** fur, which makes them difficult to see at night. Nocturnal mammals spend most of the day sleeping in their den or burrow.

Those mammals that rest at night and are active during the day are called **diurnal**.

Diurnal mammals like squirrels, have developed ways

LITTLE BROWN BAT



of surviving in the daylight. Most have protective coloration or camouflage that blends in with their environment, and their eyes are adapted to bright light. Many can move very fast in order to escape from predators.

By adapting to both day and night, mammals are able to fill the world with activity 24 hours a day.

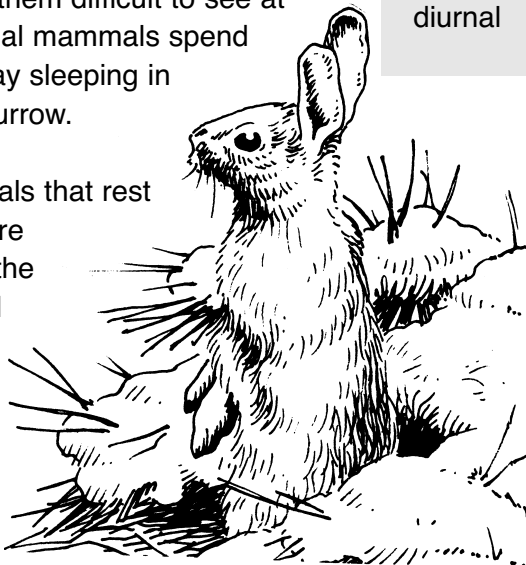
CHALLENGE YOURSELF

1. What are some differences between nocturnal and diurnal mammals?
2. Write a paragraph explaining what changes you would have to make to become nocturnal.
3. What is echolocation, and what mammals use it?

VOCABULARY

camouflage
diurnal

echolocation
nocturnal



EASTERN COTTONTAIL

ACTIVITY PAGE: Creature of the Night

What you will need

- group size: 20 or more students but can be modified for fewer students
- a blindfold

WHAT YOU DO

Go outside to a flat, open area and have students form a large circle. Choose someone to be a bat, three or four other students to be insects and another three or four students to be trees. All of these students should go to the center of the circle.

The bat must put on the blindfold. The trees should then take up random positions in the circle and remain in those spots throughout the game. The insects are free to move about anywhere in the circle.

The object of the game is for the bat to tag insects while avoiding trees. In order to do this in the “dark,” the bat must continually call out “bat.” Every time the bat makes this call, the insects and trees must respond by calling out “insect” or “tree.” When insects are tagged by the bat, they should rejoin the circle. If the bat blunders into a tree, the bat is out and someone else must put on the blindfold.

Rotate play until everyone has had a chance to be the bat, an insect or a tree.

As a group, discuss what it was like to be a bat in this activity. How is it similar to what a real bat would experience while hunting for insects at night?

