

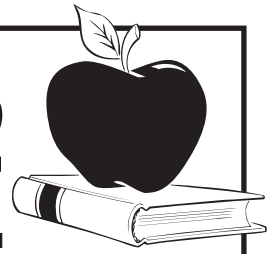
GRADE LEVELS: 3 - 4

CORRELATION TO NEXT GENERATION SCIENCE STANDARDS: 3-LS4-3, 4-LS1-1

SKILLS/PROCESSES: observation, data collection & interpretation, comparison & generalization, identification, application

OBJECTIVE: Students will become aware of the variety of mammalian locomotive techniques and adaptations.

TEACHER'S GUIDE



UNIT TWO ■ LESSON ONE

Mammals on the Move



EASTERN COTTONTAIL

BACKGROUND

Almost all animals are mobile. To find food, shelter and mates, avoid predators and interact with their environment, animals must have the ability to move.

Mammals live in a variety of environments and have adapted different strategies for locomotion. These strategies are as varied as the animals themselves but are directly related to the specific kind of environment in which they live.

Most mammals have four limbs with their appendant paws, claws and hooves, which are their means of locomotion. These **limbs** and **appendages** are specifically adapted to each species' particular needs.

Mammals that live underground in burrows, such as moles and badgers, have

claws on their forelimbs designed for digging and crawling through dirt.

Predatory mammals that chase their prey, like bobcats, have feet with thick, rough pads for traction and sharp claws for grabbing. Deer and other grazers have flat, hard hooves for solid support on soft earth and kicking for defense. Beavers and muskrats, which spend most of their lives in water, have webbing between their toes. Mammals that climb, like squirrels, have very sharp, short claws for holding.

Perhaps the most fascinating examples of locomotive adaptation among mammals are bats and flying squirrels. In the former, the forelimbs, especially the "finger bones" and the skin between them, have evolved into fully functional wings. Flying squirrels have large flaps of skin connecting their "wrists" to their "ankles" enabling them to glide great distances between trees and branches.

In most cases, the greater a mammal's need for speed, the longer its legs will be in proportion to the rest of its body.

PROCEDURE AND DISCUSSION

Review the student information with the class. Emphasize the reasons for a mammal's need to move, the variety of adaptations evolved to meet this need, and the relationships of those adaptations to the individual species' habits and environment.

1. Why do mammals move around?

Mammals move in order to find food, shelter and mates.

2. What can claws be used for?

Claws can be used for digging, running, grabbing, holding, climbing, scratching and self-defense.

3. What are limbs and appendages?

Limbs are the "arms" and "legs" of an animal, and appendages are their "hands" and "feet" or claws, paws and hooves.

4. What adaptation would most benefit an animal that digs tunnels?

Long, hard claws for scraping and shoveling soil.

VOCABULARY

appendages—the "hands" and "feet" of an animal; in the case of mammals they are usually paws or hooves

limbs—the "arms" and "legs" of an animal

EXTENSION

Draw, paint or construct a make-believe mammal. Have students describe their mammal's special adaptations for locomotion and explain where it might live.

CHALLENGE YOURSELF EVALUATION

1. Mammals need to move to find food, shelter and mates and to avoid predators.
2. Appendages are "hands" and "feet" or claws, paws and hooves.
3. Claws can be used for digging, running, grabbing, holding, climbing, scratching and self-defense.
4. Hooves would not be sensible for a squirrel because squirrels need to grasp tree trunks, branches and other objects as they climb. They also need to hold onto and pick up food. Hooves would not allow these activities to take place.
5. Some mammals need thick pads on the feet for traction.
6. A. squirrel, small foot with claws for grasping
B. skunk, large foot with claws for digging
C. coyote, thick pads and short claws
D. deer, hooves

ACTIVITY PAGE EVALUATION

Any answer which contains supporting information will work. There is no best method.

Mammals on the Move

STUDENT'S GUIDE

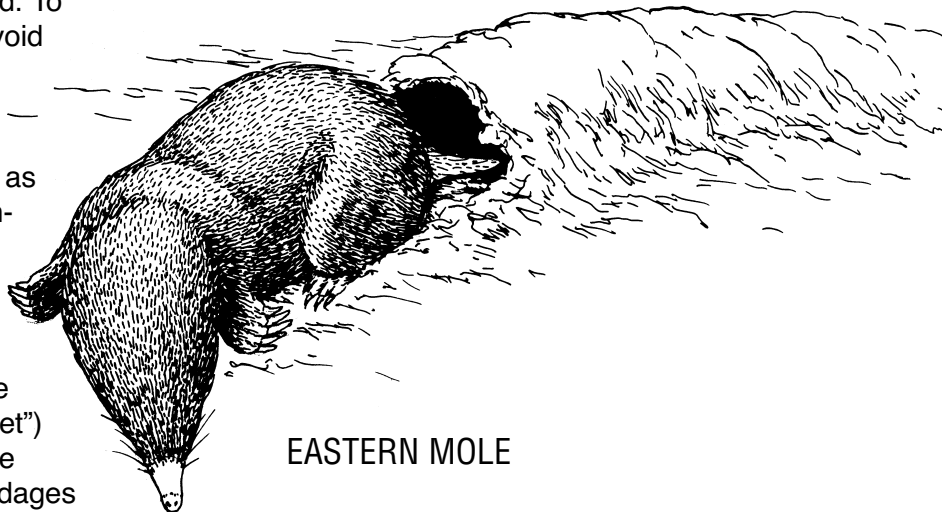
All mammals need to move around. To find food, shelter and mates, to avoid predators, and just to live in their world, they must be able to move.

The ways in which they move are as varied and interesting as the mammals themselves.

Most mammals have four limbs, but these “arms” and “legs” come in many shapes and sizes, and the appendages (their “hands” and “feet”) can be paws, claws or hooves. The exact form these limbs and appendages have depends on the specific needs and habits of the individual species.

For instance, mammals that dig burrows and tunnels have large claws on their forelimbs for scraping and crawling through the soil. Mammals that chase and hunt have feet with thick, rough pads for traction and short, sharp claws for grabbing. Those species that graze, like deer, have flat, hard hooves for solid support on soft ground and for kicking in defense. Those that spend a lot of time in the water, such as beavers and muskrats, have webbing between their toes for more efficient swimming. In addition many mammals have claws that help them to climb and forepaws they use to pick up, hold and handle food or other objects.

Two of the most fascinating adaptations of mammal limbs are found in bats and flying squirrels. In bats, the forelimbs, especially the “finger” bones and the skin between them, have evolved into wings for flying. Flying squirrels have large flaps of skin between their “wrists” and “ankles” enabling them to glide great distances between trees and branches.



EASTERN MOLE

CHALLENGE YOURSELF

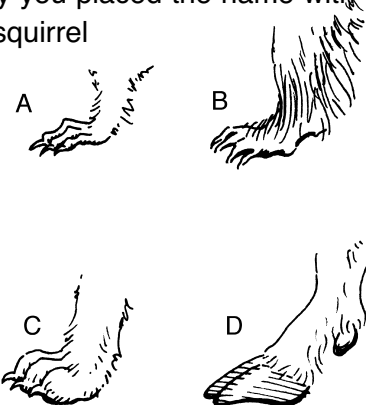
1. Why do mammals need to move around?
2. What are appendages?
3. What can claws be used for?
4. Why wouldn't hooves be sensible for a squirrel?
5. Why do some mammals need thick, rough pads on their feet?
6. Match the mammal from this list to the drawing of its foot. On the back of this page, tell why you placed the name with each foot. coyote, deer, skunk, squirrel

A. _____

B. _____

C. _____

D. _____



VOCABULARY

appendages

limbs

ACTIVITY PAGE: Mimicking Mammals

What you will need

- three long (8-12') strips of paper
- markers or crayons
- resource materials, such as the *Illinois Furbearers* poster, the IDNR *Wild Mammals of Illinois* resources trunk, mammal or animal track field guides

WHAT YOU DO

Find examples of various mammal tracks, and the patterns the mammals leave as they walk.

Choose three of these species and adjust their track size and spacing to match your own proportions. Sketch the tracks on the strips of paper, as if the animal had walked along its length.

Placing your own hands and feet on the first four tracks, try to walk in their footsteps.

Some animals walk by moving both left feet, then both right feet. Others move right front and back left then left front and right

back. Still others hop. Try “walking” on all fours in all these combinations.

What do you think is the best method of walking? Why? Write a paragraph about a mammal with the type of movement you selected, explaining why its method of moving is best. You may need to do some research about the mammal to collect more information about its life.

