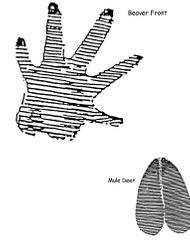

Neat Feet



Objective

This activity connects science and math. Students will learn about mammal habitats after calculating how much weight their feet support.

Materials

Provided in the kit:

- Neat Feet Activity Sheet
- Neat Feet Footprint Sheet

Not provided in the kit:

- Graph paper
- Calculators

Appropriate Grade Level: 6-8

Time Required: 30-40 Minutes

Curriculum Benchmarks:

Life Science, Diversity/Interdependence:
Describe how adaptations help an organism survive in its environment.

Math, Calculations/Estimations:
Perform calculations on whole numbers, fractions, decimals, and integers using paper and pencil or calculators.

Activity Inventory:

See materials list.

Background Information

This activity is an extension of an AIMS activity by the same name. In the AIMS activity, students measure the weight supported by their feet (per unit area). The activity presented here takes the idea a step further and looks at adaptations to different environments.

You can learn a lot about the habitat and behavior of an animal by examining how it is built. Teeth tell us a lot about what an animal eats and their feet can tell a lot about where they live.

Animals that live on firm ground do not need a lot of foot area to support their weight. However, those that live on soft and unstable surfaces need much more foot area to support their weight. Snow and mud are two surfaces that do not support weight very well. To keep from sinking, weight must be spread out over a large area. As a result, ptarmigan, caribou and beavers all have relatively large feet for their mass. An example among humans is the use of snowshoes to decrease the weight per unit area.

Activity

Prior Preparation

1. Make enough copies of the Neat Feet Activity Sheet and the Neat Feet Footprints Sheet for each student.
2. Have enough graph paper and calculators for each student.

Procedure

1. Introduce and explain the activity to the students.

Neat Feet



2. Hand out the following materials to each student: Neat Feet Activity Sheet, Neat Feet Footprint Sheets, graph paper, and a calculator. You may want to review the procedures indicated on the Neat Feet Activity Sheet.
3. The students can follow the procedures indicated on the Neat Feet Activity Sheet.
4. After the students complete the activity sheet, review the answers.
5. Wrap up the activity by talking about the general types of animal feet (tracks) you might find in a wetland, in the desert, in the Rogue Valley.

Assessment

Collect the Neat Feet Activity Sheet for completeness and understanding.



Neat Feet Activity Sheet

Problem: How much weight per unit area do the feet of different animals support?

Materials:

- Neat Feet Footprint Sheets
- Graph paper
- Calculator

Procedure:

1. Trace the footprints from the Neat Feet Footprint Sheets onto the graph paper.
2. Count the number of squares covered by the footprint. A square that is more than half covered by the footprint is considered to be covered.
3. Enter the data on the table (on the back of this sheet), and calculate the results.
4. Answer the following questions.

Questions:

1. The ptarmigan is a pheasant-like bird that lives in Alaska and Canada. It grows feathers on its feet in the winter. Which foot (summer or winter) supports the most weight per unit area?

2. Explain the difference.

3. Do the feet of the deer or the caribou support the most weight per unit area?

4. Explain why the animals might be different.

5. Do the feet of the beaver or porcupine support the most weight per unit area?

6. Explain why the animals might be different.



Neat Feet Activity Sheet

Fill out the tables below.

PTARMIGAN	Weight	Area	Weight/Area
Summer	1.5 pounds		
Winter	1.5 pounds		

DEER	Habitat	Weight	Area	Weight/Area
Mule Deer		125 lbs		
Caribou		200 lbs		

RODENTS	Habitat	Weight	Area	Weight/Area
Beaver		45 lbs		
Porcupine		19 lbs		

Note: $\text{Weight} \div \text{Area} = \text{Weight/Area}$



Neat Feet Activity Sheet

(Teacher Answer Sheet)

Questions:

1. The ptarmigan is a pheasant-like bird that lives in Alaska and Canada. It grows feathers on its feet in the winter. Which foot (summer or winter) supports the most weight per unit area?

The foot of the summer ptarmigan supports the most weight per unit area.

2. Explain the difference.

The winter foot spreads the weight out so that the bird won't sink into the snow.

3. Do the feet of the deer or the caribou support the most weight per unit area?

The deer feet support the most weight per unit area.

4. Explain why the animals might be different.

Like the ptarmigan in winter, the caribou lives in a snow-covered habitat. Also, in the summer the tundra is quite muddy, and the large feet relative to weight help support the caribou here, too.

5. Do the feet of the beaver or porcupine support the most weight per unit area?

The porcupine feet support the most weight per unit area.

6. Explain why the animals might be different.

Beavers live in a muddy habitat and their large feet relative to their weight help support the animal in the mud without sinking.

