



Self-Directed Curriculum

Feet

Are

Neat



Self-Directed Curriculum Kits

- **Connect With Wildlife**

Students compare and identify twelve different Pennsylvania mammals using their pelts and wildlife background information.

- **Decoy Detective**

Students use the decoys to learn about waterfowl identification and divide birds into a diver or puddle duck classification.

- **Feet Are Neat**

Students explain the role of bird feet in bird survival and compare and contrast bird feet adaptations.

- **Let's Wing It**

Students compare and identify the different types of flight feathers that make up a bird's wing.

- **Scatology**

Students create fake animal scat and learn to identify an animal by its droppings.

- **Skull King**

Students infer from a skull what classification and niche the animal inhabits.

- **The Nose Knows**

Students identify different food smells and will compare the ability to distinguish different smells to animals using their sense of smell to find mates, offspring and food.

- **Wildlife Tracks**

Students use a variety of methods to observe, identify, collect and document tracks of different common wildlife species in Pennsylvania.

FEET ARE NEAT - Teacher's Page

from *PA Songbirds* curriculum

Objective:

Students will explain the role of bird feet in bird survival. Students will compare and contrast bird feet adaptations.

Materials Needed:

- Box of dried bird feet (with ID key)
- Paper plates
- Feet Are Neat worksheets

Background:

See *PA Songbirds* lesson plan Feet Are Neat (attached)

Activities:

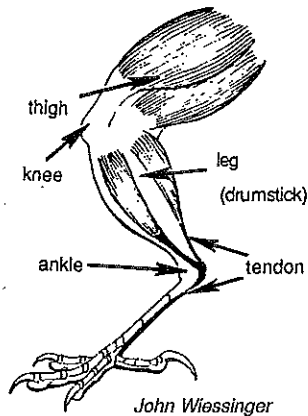
See the "Procedure" section of the *PA Songbirds* lesson plan Feet Are Neat (attached).

Additional procedure to those included in *PA Songbirds*:

4. After discussing the ways that birds can use their feet, break students into small groups (3 -5). The teacher puts 3-4 different types of feet on a paper plate for each group. Using the Feet Are Neat worksheets, the group can randomly decide which of the feet they will identify as A, B, C or D. Give the groups 10-12 minutes to look at their feet and complete their chart, identifying what type of foot each matches (climber, grasper, percher, etc.). They may also try to guess what type of bird each foot came from. After students are done, the teacher can choose different feet from each plate and have the students stand up and talk about their bird's feet. Using the key card, the teacher should help correct any incorrect answers.

Lesson 7

Feet Are Neat!



Age: Grades K-5

Subjects: Art, science

Skills: Knowledge, inferring, comparison and contrast, application

Duration: 45 minutes

Group size: Variable

Setting: Indoors

Key vocabulary: Perch, tendon

OBJECTIVE:

Students will explain the role of bird feet in bird survival.

METHOD:

Students study pictures of birds, and draw conclusions about the birds based upon the type of foot.

MATERIALS:

Pictures or slides of birds/bird feet.

BACKGROUND:

A bird's "footwear"—its legs and feet—have developed over millions of years to meet the needs of the bird. What most of us consider the leg of a bird is actually its foot, with an elongated instep slanting upwards and backwards to the heel. A bird's knee, which bends forward as ours does, is usually hidden by feathers.

Birds use their feet in many ways, from walking to perching to capturing prey. Most birds have four toes, with the first toe (the hallux) normally facing backward and the other three forward.

Perching birds sleep with their toes locked on a perch. When the bird relaxes in sleep, its body slumps on its feet, causing a tendon that passes behind the heel to tighten. This draws the three forward toes and the hind toe toward each other, clamping the bird to the perch. To release the clamp, the bird simply rises from the slumped position.

PROCEDURE:

1. Begin by asking the students to draw upon their knowledge of birds by asking a few basic questions:
 - How do birds use their feet? (*Perch, swim, cling to a trunk, walk, dive, capture prey*)

- Can a foot perform more than one function? (For example, ducks can swim and walk, but raptors don't normally swim.)
- How are human feet like bird feet?
- How do they differ?

2. Discuss variations in bird foot design. Use magazine pictures or slides, or study skins borrowed from a visitor center or from the Pennsylvania Game Commission. Here are some examples:

Climbers: Woodpeckers have two toes in front and two toes in back for climbing up and down tree trunks.

Graspers: Hawks, owls, and other birds of prey have large curved claws, called talons, that dig into their prey and help them hold onto it in flight.

Perchers: Robins, mourning doves, and many other birds have three toes that face forward and one long hind toe that helps them grip their perches tightly.

Waders: Herons and bitterns have three toes in front and one in back, with long stilt-like legs.

Runners: Ostriches and killdeer have two and three toes, respectively (instead of four), and all their toes point forward for fast running.

Scratchers: Pheasants, chickens and other chicken-like birds have strong toes for scratching in the soil.

Swimmers: Ducks, coots, and other swimmers use their feet as paddles.

3. Show the students some pictures or slides of bird feet. Have the students explain how the feet would be used. (Examples: Wrens—perching feet; wood ducks—swimming feet; woodpeckers and nuthatches—climbing feet; grouse—scratching feet; herons and egrets—wading feet; hawks—talons for seizing prey.)

EXTENSIONS:

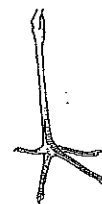
- Challenge students to design an imaginary bird, using the medium of their choice. Have each student explain how his/her bird is adapted for finding a specific food and living a specific lifestyle. (See Chapter 1, Lesson 12, Adaptation Artistry.)
- Give each child a picture of a bird. Spread out pictures of possible habitats or possible foods. Have each child match his/her bird with appropriate food or habitat.
- Make a permanent record of bird footprints. Materials: clear set of prints found in mud or sand, plaster of Paris, a strip of cardboard. Procedure: Place the cardboard around the footprint and clip the ends together to make a ring. Mix plaster of Paris with water, pour into ring, and allow to set. Carefully remove the casting. Label with the date, location, and species of bird.
- Take the students on a bird walk. Have them observe birds with various types of feet and discuss how the different species were using their feet.



Woodpeckers: Strong toes and large nails for clinging to trees. 2 in front hang on, 2 in back help brace.



Grouse: Strong foot and leg for walking and running.

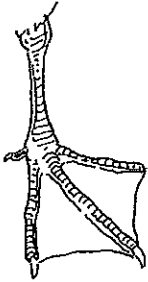


Herons: Long foot and toes for wading also provide large surface area for walking in muddy places.



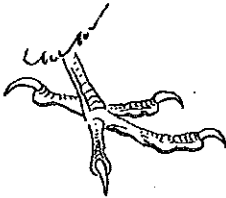
Perching Birds: Rather delicate toes used for grasping branches.

All drawings by John Wiessinger



John Wiessinger

Ducks: Webbed toes form paddles for swimming.



John Wiessinger

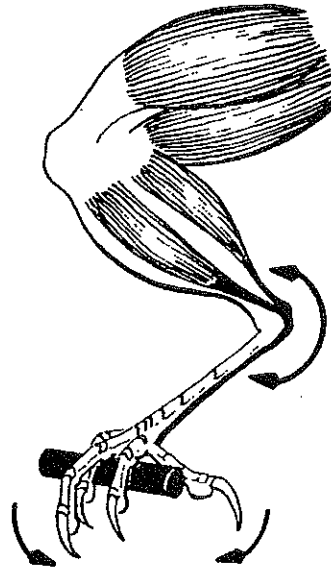
Hawks: Strong toes with large nails (talons) can grasp and hold struggling prey.

The muscles which cause a bird's leg to bend are attached to the toes by tendons which stretch over the ankle. When these muscles contract or when the bird squats, the tendons pull on the base of the toes, causing the toes to curl.

EVALUATION:

- Students will give examples of bird feet and describe how the feet enable the bird to survive in its habitat.

Adapted with the permission of the National Wildlife Federation from the "Birds, Birds, Birds!" issue of *NatureScope*.



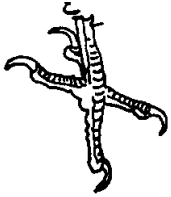
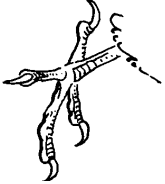


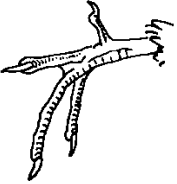

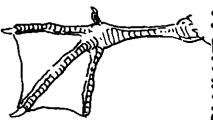
John Wiessinger

The more the bird bends its ankle, the tighter the curl. When a bird sleeps, its ankle is bent to its maximum and the toes grip the perch with surprising strength.

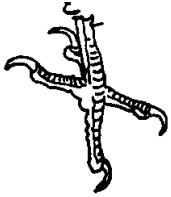
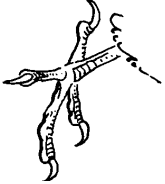

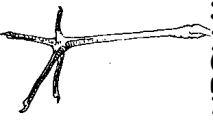
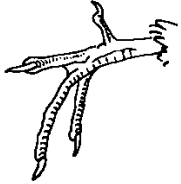

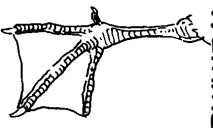
FEET ARE NEAT

	CLIMBER	GRASPER	PERCHER	WADER	RUNNER	SCRATCHER	SWIMMER	WHAT AM I?
A								
B								
C								
D								

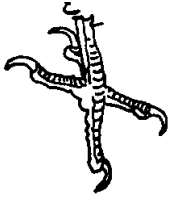
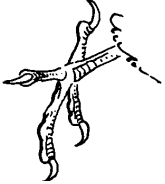

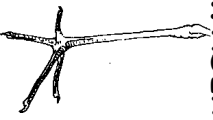
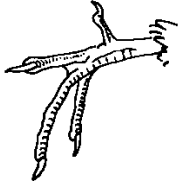

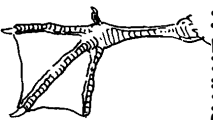
FEET ARE NEAT - KEY (Black)

	CLIMBER	GRASPER	PERCHER	WADER	RUNNER	SCRATCHER	SWIMMER	WHAT AM I?
Black Zip Tie								Songbird
A Smallest			X			X		
B Next biggest		X	X					Great-horned owl
C Largest			X	X				Great egret
D Webbed			X				X	Duck

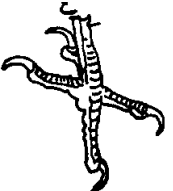
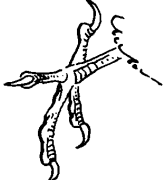




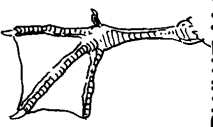
FEET ARE NEAT - KEY (Black/Orange)

	CLIMBER	GRASPER	PERCHER	WADER	RUNNER	SCRATCHER	SWIMMER	WHAT AM I?
Black/ Orange Zip Tie								
A Smallest			X			X		Songbird
B Next biggest		X	X					Osprey
C Largest			X		X	X		Ring-necked pheasant
D Webbed			X				X	Cormorant

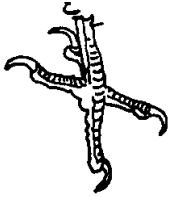
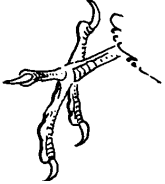

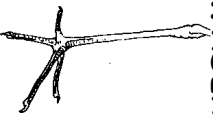
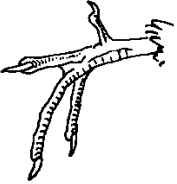

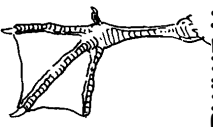
FEET ARE NEAT - KEY (Blue)

Blue Zip Tie	 CLIMBER	 GRASPER	 PERCHER	 WADER	 RUNNER	 SCRATCHER	 SWIMMER	WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest		X	X					Screech owl
C Largest			X		X	X		Ruffed grouse
D Webbed			X				X	Duck

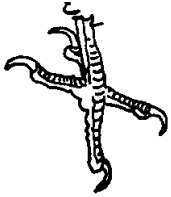
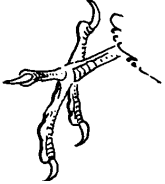

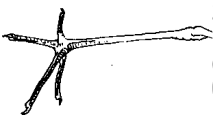
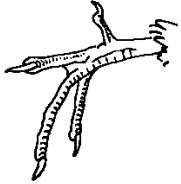


FEET ARE NEAT - KEY (Blue/White)

Blue/ White Zip Tie	CLIMBER 	GRASPER 	PERCHER 	WADER 	RUNNER 	SCRATCHER 	SWIMMER 	WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest		X	X					Screech owl
C Largest			X		X			Turkey vulture
D Webbed							X	Canada goose

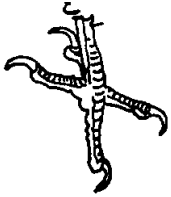
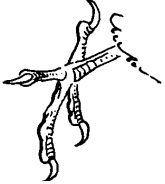

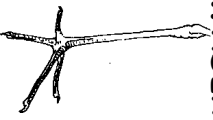
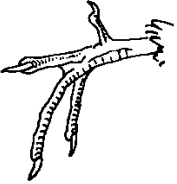

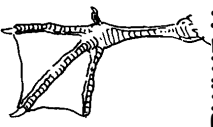
FEET ARE NEAT - KEY (Green)

Green Zip Tie								WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest			X	X				Little Green Heron
C Large Talons		X	X					Osprey
D Webbed			X				X	Cormorant

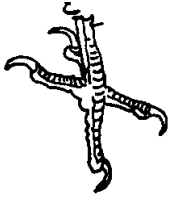
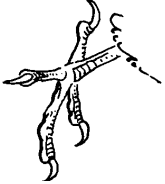


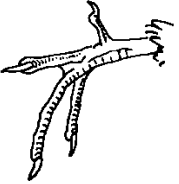

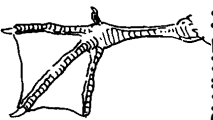
FEET ARE NEAT - KEY (Green/White)

Green/ White Zip Tie	 CLIMBER	 GRASPER	 PERCHER	 WADER	 RUNNER	 SCRATCHER	 SWIMMER	WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest		X	X					Hawk
C Largest			X		X	X		Turkey
D Webbed			X				X	Duck

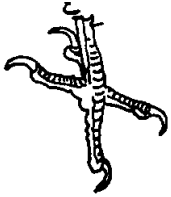
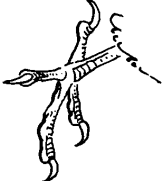


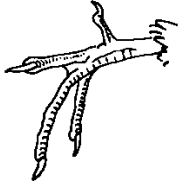

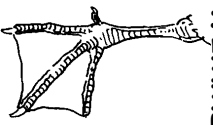
FEET ARE NEAT - KEY (Orange)

Orange Zip Tie								WHAT AM I?
A Smallest			X			X		Kingfisher
B Next biggest		X	X					Red-tailed hawk
C Largest			X		X	X		Turkey
D Webbed			X				X	Duck

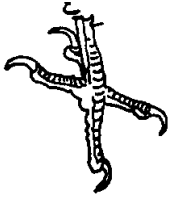
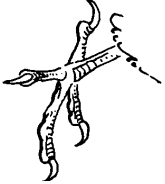

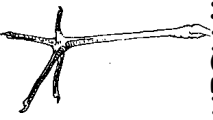
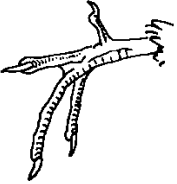

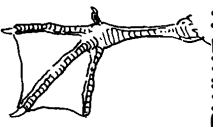
FEET ARE NEAT - KEY (Orange/Blue)

Orange/ Blue Zip Tie	CLIMBER	GRASPER	PERCHER	WADER	RUNNER	SCRATCHER	SWIMMER	WHAT AM I?
A Smallest								Songbird
B Next biggest		X	X					Barn owl
C Largest			X		X	X		Ring-necked pheasant
D Webbed							X	Canada goose

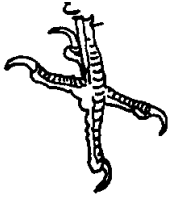
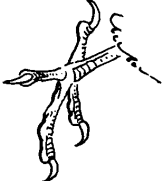

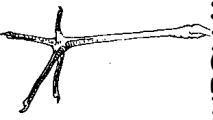
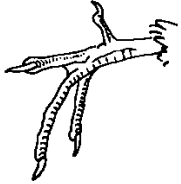

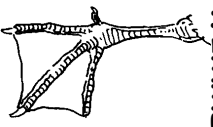
FEET ARE NEAT - KEY (Red)

	CLIMBER	GRASPER	PERCHER	WADER	RUNNER	SCRATCHER	SWIMMER	WHAT AM I?
Red Zip Tie								Songbird
A Smallest			X			X		
B Next biggest			X		X	X		Ring-necked pheasant
C Largest		X	X					Great-horned owl
D Webbed			X				X	Gull

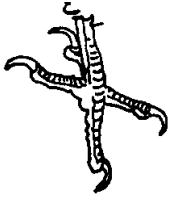
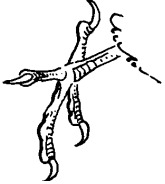

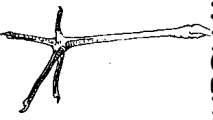
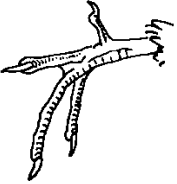

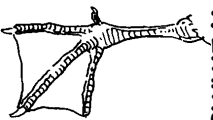
FEET ARE NEAT - KEY (Red/White)

Red/ White Zip Tie								WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest		X	X					Coopers hawk
C Largest			X		X			Turkey vulture
D Webbed							X	Swan

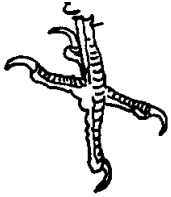
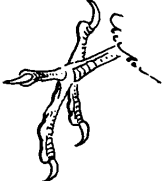

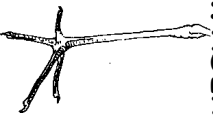
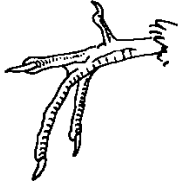

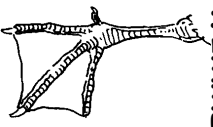
FEET ARE NEAT - KEY (Tan)

Tan Zip Tie								WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest			X	X				Little green heron
C Largest		X	X					Osprey
D Webbed			X				X	Cormorant

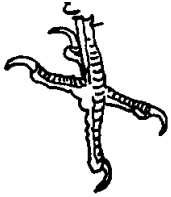
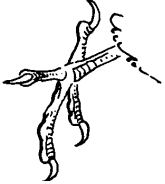

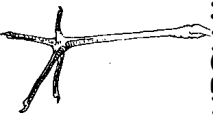
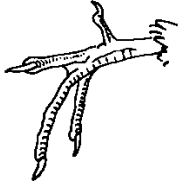

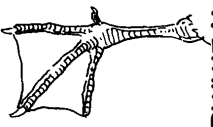
FEET ARE NEAT - KEY (Tan/Orange)

	CLIMBER	GRASPER	PERCHER	WADER	RUNNER	SCRATCHER	SWIMMER	WHAT AM I?
Tan/ Orange Zip Tie								Songbird
A Smallest			X			X		
B Next biggest		X	X					Screech owl
C Largest			X		X	X		Turkey
D Webbed			X				X	Duck

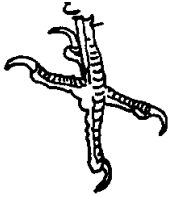
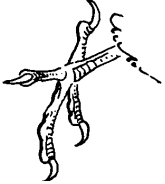

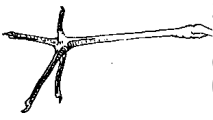
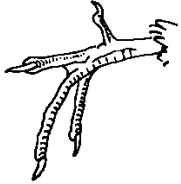


FEET ARE NEAT - KEY (White)

White Zip Tie								WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest		X	X					Coopers hawk
C Largest		X	X					Crow
D Webbed			X				X	Duck

FEET ARE NEAT - KEY (Yellow)

Yellow Zip Tie								WHAT AM I?
A Smallest			X			X		Songbird
B Next biggest		X	X					Sharp- shinned hawk
C Largest			X		X	X		Turkey
D Webbed			X				X	Duck

FEET ARE NEAT - KEY (Yellow/Blue)

	CLIMBER	GRASPER	PERCHER	WADER	RUNNER	SCRATCHER	SWIMMER	WHAT AM I?
Yellow/ Blue Zip Tie								Yellow Blue Zip Tie
A Smallest			X			X		Songbird
B Next biggest			X		X	X		Ruffed grouse
C Largest		X	X					Great-horned owl
D Webbed			X				X	Duck