

Eastside Audubon  
your connection to nature

# Bird

# Discovery

# Box

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## TO THE EDUCATOR

We are glad that you are using the Bird Discovery Box to teach your students more about birds. We hope this guide will inspire you to try new activities and new ways of teaching a unit on birds, including moving the classroom from indoors to outdoors. These activities will help you do this in a structured manner that will increase your students' enthusiasm and their learning.

**Note:** This is a nut-free bird box. Please do not contaminate with nut residue.

## EASTSIDE AUDUBON

The Eastside Audubon Society (“EAS”) modeled the Bird Discovery Box after that created by the Vancouver Audubon Society. This Bird Discovery Box was funded by donations from its general membership and a grant from REI. EAS is an affiliate of the National Audubon Society. These organizations are actively involved in conserving natural resources and educating citizens about our environment. The EAS education program is committed to instilling a love of the environment through exploration and observation of the world around us. We hope to empower children and adults to treat the earth with respect and to take action when needed to protect natural areas and wildlife species. EAS has been active in environmental education in East King County for 25 years and has many resources to share with schools and community groups.

To obtain more information, please contact:

Eastside Audubon  
P.O. Box 3115  
Kirkland, WA 98083-3115  
(425) 576-8805  
(425) 828-4036 fax  
[www.eastsideaudubon.org](http://www.eastsideaudubon.org)

Or visit our office during regular office hours. Call ahead for current hours:  
425-576-8805

## **BIRD DISCOVERY BOX**

The box was conceived because of the increasing interest of educators to teach bird units and to use hands-on activities and the outdoors for a classroom. This box will enable users to have a broad range of resources and a guide that will provide many activities and projects that can be used in the classroom and outdoors. The activities are written for K-12 and are interdisciplinary and hands-on. The activities in this guide will help you reach your benchmarks for the Essential Academics Learning Requirements in science.

## **GOALS**

The overall purpose of the Bird Discovery Box is to increase the knowledge of students about birds of the Northwest and to encourage the development of skills used by scientists such as:

- Using binoculars
- Collecting and interpreting data
- Conducting experiments using scientific processes
- Making predictions, observations and evaluations

The ultimate goals for teachers and students are to create a habitat for birds on their school sites and to collect data over time. These goals will have a positive and lasting effect on students' attitudes towards birds and the importance of habitat.

## BIRD BOX CONTENTS

### Box A – Field Study

- 13 Stokes Beginning Bird Guides
- 1 Peterson Beginner Guide
- 1 Stokes Western Field Guide
- 9 Binoculars
- 1 Sibley Field Guide to Birds of Western North America

### Box B – Classroom

#### Books

- √ Hawk Highway in the Sky
- √ How Do Birds Find Their Way
- √ She's Wearing A Dead Bird on Her Head
- √ Exploring the World of Birds
- √ Eyewitness Books - Birds
- √ Birds: The Inside Story, VAS
- √ Peterson Backyard Birds
- √ Familiar Birds of the Northwest
- √ Owl Moon
- √ Feathers for Luck

#### CD

- √ Western Bird Songs
- √ (Peterson, 2 disk set)

#### Videos

- √ BIRDS by Eyewitness

#### Other Resources

- √ Activity Guide
- √ 1 Poster: Backyard Birds
- √ Feathers
- √ Nest with eggs
- √ 1 Hand Lens
- √ 3 magnifying glasses
- √ 14 Mini magnifying glasses

## BIRD BOX CONTENTS CHECKLIST

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- Feathers
- Nest with eggs
- 1 Hand Lens
- 3 Magnifying Glasses
- 14 Mini Magnifying Glasses

## **Acknowledgements**

This Educator's Guide is the result of the work of many people who are interested in furthering environmental education in East King County. We'd like to thank the following people who contributed time and expertise to this project.

### **WRITING**

Carol Peterson

### **EDITING**

Jan McGruder  
Michelle Amicucci  
Mary Britton-Simmons

### **GRAPHIC DESIGN**

Jan McGruder

### **ILLUSTRATIONS**

Catherine J. Miller

# OBJECTIVES

## OBJECTIVES

The objectives of the Bird Discovery Box are to:

- ◆ Learn to identify some common birds in the Northwest.
- ◆ Learn to identify the songs of these birds.
- ◆ Learn about bird behaviors.
- ◆ Learn about adaptations of birds.
- ◆ Learn about habitat and its importance to wildlife. .
- ◆ Learn about the feeding habits of these birds.
- ◆ Learn the steps to setting up a bird-feeding station.
- ◆ Learn how to design a home or school habitat for birds.
- ◆ Promote a lasting concern for the health of the planet.
- ◆ Practice the following skills:

observation

application of concepts

critical thinking

analysis

data collecting

classification

listening

discussion

comparison & contrast

concept development

evaluation

problem solving

computation

# **TEACHER REFERENCES**

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## HOW TO STUDY BIRDS

Bird watching, a life-long hobby, can be enjoyed throughout the year. You can visit many habitats where you will probably find different birds in winter and summer. Keep a list of those you see. The first step is to learn the bird silhouettes and field marks. Then, you are on your way. Bird watching is a great way to get outdoors and start learning about the ecology of the area where you live.

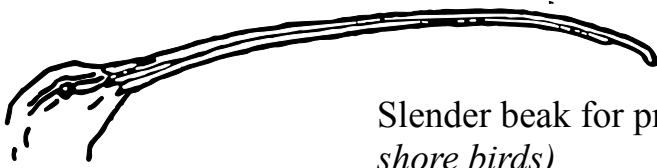
## ADAPTATIONS

Birds have many different types of feet and beaks depending upon where they live and what they eat. Plants and animals adjust or adapt to survive in certain habitats.

- ◆ Songbirds have perching feet and short, thick seed-eating bills or thin insect-eating bills.
- ◆ Birds of prey have talons for catching prey and beaks for tearing meat.
- ◆ Hummingbirds have long slender bills for sucking nectar and plucking insects.
- ◆ Waterfowl have flat bills for eating small water plants.
- ◆ Wading birds have long legs and widespread toes for wading in water and long thin bills for catching fish and other water animals.

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## BEAK ADAPTATIONS



Slender beak for probing mud (*Long-billed Curlew and other shore birds*)



Slim, sharp beak for catching flying insects (*swallows, flycatchers*)



Short, thick beak for crushing seeds (*finch*)



Broad beak for scooping plants and crustaceans and for straining water from mud (*ducks, coots*)



Sharp, hooked beak for tearing meat (*Northern Harrier*)



Long, hooked beak for catching fish (*cormorant, pelican*)



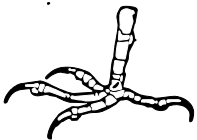
Long, broad beak for spearing prey (*egrets, herons*)

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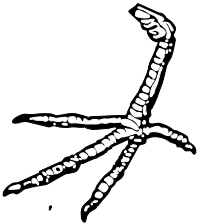
## FEET ADAPTATIONS



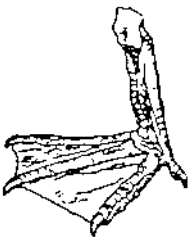
Two toes in front and two toes in back for climbing (*Downy Woodpecker*)



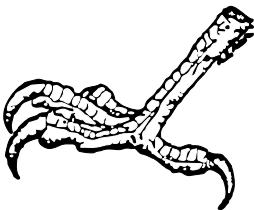
Three toes in front and one toe in back for perching (*sparrows, wrens, blackbirds*)



Long toes for wading (*egrets, herons*)



Webbed feet for swimming (*ducks, coots*)



Sharp-clawed feet for grasping (*hawk, owl*)

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**EXAMPLES OF ADAPTATIONS AND ADVANTAGES**

	ADAPTATION	BIRD	ADVANTAGE
Beaks	Pouch-like	Pelican	Holding fish
	Long, thin	Avocet	Probing shallow water and mud for insects
	Pointed	Woodpecker	Breaking and probing bark of trees for insects
	Curved	Hawk	Tearing solid tissue, such as meat
	Short, stout	Finches	Cracking seeds and nuts
	Slender, long	Hummingbird	Probing flowers for nectar
Feet	Webbed	Duck	Walking on mud
	Long toes	Crane, heron	Walking on mud
	Clawed	Hawk, eagle	Grasping food when hunting prey
	Grasping	Chicken	Sitting on branches, roosting protection
Legs	Flexor tendons	Chicken	Perching, grasping
	Long, powerful	Ostrich	Running
	Long, slender	Heron	Wading
	Powerful	Eagle	Lifting and carrying prey
Wings	Large	Eagle	Flying with prey, mating rituals
	Muscles	Hawk	Soaring while hunting
	Large		
Coloration	Bright plumage	Male Birds	Attraction in courtship Mating rituals
	Dull plumage	Female Birds	Camouflage while nesting Protection in shelter
	Change of plumage with seasons	Owl Ptarmigan	Camouflage Protection: brown in summer; white in winter Protection in shelter

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## FIELD MARKS

Every species of bird has a different size and shape. The first step in learning to identify birds is to learn these characteristics. By knowing the approximate size of a bird, you will be able to compare one bird to another. It is very helpful to be able to say a bird is smaller than a robin or larger than a sparrow, etc.

Other parts of birds that differ in size and shape are: wing, tail, bill, crest, legs, feet.

Some birds can be identified by color and/or shape alone. But most birds are not that easy. The most important aids are what we call "field marks." Here is a list of the most helpful ones for which to look:

1. Eyes and crown ( top of the head)
  - ◆ What color is the eye?
  - ◆ Does the crown have a stripe or patch, or is it plain?
2. Tail
  - ◆ Does it have a band across the bottom?
  - ◆ Does it have white sides or spots?
3. Breast
  - ◆ Is the breast plain, spotted, or streaked?
4. Wings
  - ◆ Do they have wing bars such as warblers?
  - ◆ Do they have patches such as waterfowl?
5. Rump (patch above tail)
  - ◆ Does the bird have a light rump patch?

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## **BEHAVIOR**

How does the bird behave? Does it:

- Climb on trees upward in spirals or jerk like a woodpecker?
- Feed on the ground and hop like a robin or walk like a blackbird?
- Cock its tail up like a wren or down like a flycatcher?
- Fly in a straight line or dip up and down?  
Soar like a gull or hawk?  
Beat its wings slowly or rapidly?
- Take off from the water in one jump or take a running start?
- Dive under the water or tip upside down (dabble) like a Mallard?

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## HABITAT

The birds that we study will be from urban and suburban habitats and can be classified accordingly:

- ◆ Fields, meadows and brushy places
- ◆ Mixed deciduous and evergreen woodlands
- ◆ Lakes and streams

### PUGET SOUND HABITATS

We think that these Bird Discovery Box activities are important because the habitats and birds in our area are disappearing at a rapid rate. East King County used to be full of wetlands. Many of these wetlands were filled in for development before we had land-use planning, and some are still being destroyed. Other habitats are in jeopardy as our population increases. There are some things that people can do to help maintain habitat for wildlife especially birds. We will address that issue later in the guide.

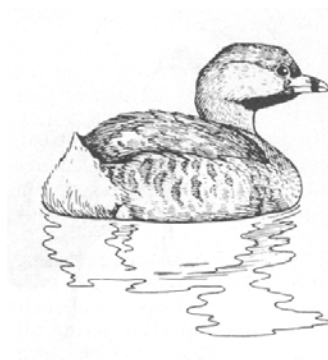
Learning about bird habitats is a vital tool in learning to identify birds in the field. If you are looking for a particular bird, it is helpful to know where to find it. If you want to protect a particular species of bird, you need to know what type of habitat to save. Following is a list of the birds on which we will focus in this guide along with a picture and a brief description of each.

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## BIRDS FEATURED IN THE BIRD DISCOVERY BOX

### Pied-billed Grebe (*Podilymbus podiceps*)

L 13" Stocky grebe with distinctive thick bill. Similar to Least Grebe, more vocal and secretive than other grebes. Usually found on sheltered ponds near vegetation. Note year-round drab plumage.



### Double-crested Cormorant (*Phalacrocorax auritus*)

L 33" Large dark bird, often seen perching with wings extended. Flies with kinked neck. Found in open water on ocean or lakes – often in flocks.



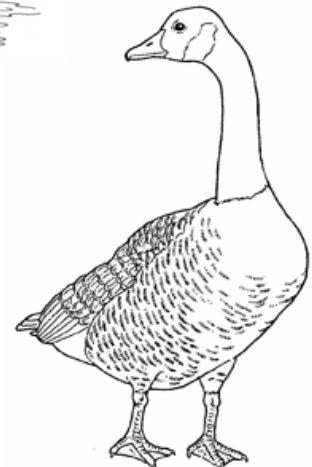
### Great Blue Heron (*Ardea herodias*)

L 46" Largest and heaviest heron in North America. Also, most vocal, often calling in flight. Generally solitary, it hunts fish and other animals while wading slowly in quiet waters.



### Canada Goose (*Branta canadensis*)

L 45" One of our most familiar birds and widespread across North America, often found in lakeside parks. Distinguished by long, black neck and white cheeks.

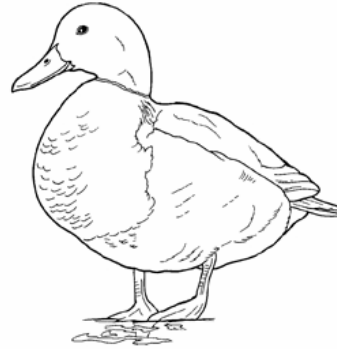


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**Mallard (*anas platyrhynchos*)**

L 23” Large, heavy duck with broad wings and slower wing beats than other dabbling ducks. Male has dark green head, reddish breast, pale gray body, and black tail with one upcurled feather. Female is brownish-gray above, with paler belly. Female also has bright orange bill, and male and female have bright orange feet. Found in any wet habitat from city parks to tundra ponds.



**Green-winged Teal (*Anas crecca*)**

L 14” Smaller and more compact than any other dabbling duck. Male has dark red head with broad, green eye stripe, dark gray back, lighter gray sides and pale yellow tail feathers. Female is dark brown with green wing bar and pale yellow tail feathers. Often found in tight flocks in shallow or muddy ponds.



**Red-tailed Hawk (*Buteo jamaicensis*)**

L 19” Dark brown hawk with white front, darker “belly band” and red tail. Often seen perched along roadsides in trees or on light poles. Mainly eats mammals, hunted from perch or by “kiting” above one area.



**Bald Eagle (*Haliaeetus leucocephalus*)**

L 31” Adult is dark brown bird with white hood and tail, bright yellow beak and feet. First year juvenile is dark brown with brown bill, which, over the course of four years, turns to adult coloration. Eagles have broad, straight-edged wings and soar with wings spread nearly flat. Usually found near water and feed mainly on fish.



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**Osprey (*pandion haliaetus*)**

L 23” Distinctive bird with dark back, white front and dark eye stripe. When flying, the Osprey’s long, narrow, angled wings look more like a gull than a hawk. Osprey fish by hovering over water, then plunging feet first to catch its prey. Calls loudly when flying – usually a single, loud, shrill whistle *teeeaaa*.



**American Coot (*Fulica Americana*)**

L 15 ½” Stocky, dark gray bird with black head and white bill. Seen on fresh and salt water and seems to bob like a cork. Feeds by diving for aquatic plants.



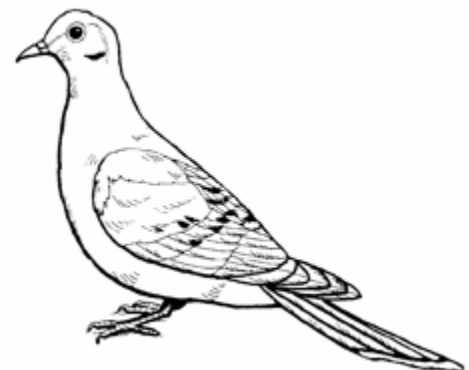
**Kildeer (*Charadrius vociferous*)**

L 10 ½” Dark brown bird with white belly and two black upper-breast bands, pinkish legs and long tail. Often found on farmland, ballfields and open meadows. Nests on ground in graveled areas. Will fake a broken wing to distract predators away from nest site.



**Rock Pigeon (*Columbia livia*) (previously Rock Dove)**

L 12 ½” This introduced species is a familiar city bird found throughout the United States. Its natural color is pale gray with darker hood, with white cere, but inter-breeding has produced birds in white (rare), brown, black, and everything in between.



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**Barn Owl (*Tyto alba*)**

L 16” This owl has light reddish gray back, white breast, white, heart-shaped face and long legs. It hunts mostly at night and preys on rodents. If seen flying at night, the Barn Owl appears ghostly. Call is a simple, long, hissing shriek.



**Great Horned Owl (*Bubo virginianus*)**

L 22” Very dark bird with stout ear tufts, which give it a cat-like appearance. Our most widespread owl, found in many wooded habitats and often seen on prominent perches at dusk. Great horned owls hunt mammals - up to rabbit size – and is the only bird that preys on skunks. This owl’s song is a familiar, rhythmic series of *hoo hoodoo hoooo hoo*, which is often attributed to all owls.



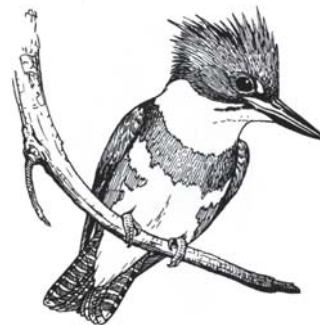
**Rufous Hummingbird (*Selasphorus rufus*)**

L 3 ¾” Our most common hummingbird, it feeds on nectar and insects. Adult male identified by reddish-brown back, green crown and iridescent orange-red gorget. Females are green on back with a whitish breast. Common in forests, woodland edges and home gardens.



**Belted Kingfisher (*Ceryle alcyon*)**

L 13” Dark slate blue bird with white belly and chin, dark red breastband, large dark bill and shaggy crest. Short tail and very short legs. Kingfishers are fish-eating birds who use trees or wires for lookout perches and catch fish by plunge-diving head first into water. Nest in holes in dirt banks.



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**Downy Woodpecker (*Picoides pubescens*)**

L 6  $\frac{3}{4}$ " This is a small, black and white woodpecker with a short, slender bill and barred outer tail feathers. Seen in suburbs, woods and at feeders. Feeds on insects and Seeds.



**Northern Flicker (*Colaptes auratus*)**

L 12  $\frac{1}{2}$ " Flickers are large woodpeckers with brown, barred backs and a black breast crescent. In flight, note the white rump and salmon under the wings and tail. Ants are their main food source, so they're often seen on the ground.



**Steller's Jay (*Cyanocitta stelleri*)**

11  $\frac{1}{2}$ " This "blue jay" is blue with a black crest, throat and upper breast, with blue stripes over the eye. This year-round resident is a common backyard bird. Eats seeds and fruit in winter and insects during the summer.



**American Crow (*Corvus brachythynchos*)**

17  $\frac{1}{2}$ " Largest black bird, seen year round in cities and country. Eats road kill year round, seeds and fruit in winter, and insects and eggs in summer. Predator of others' eggs and young birds.



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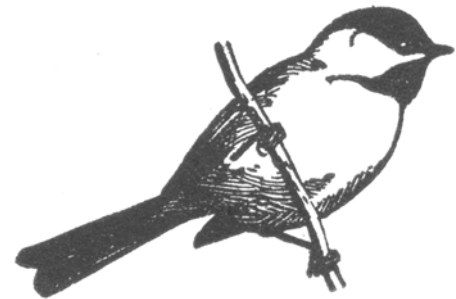
**Barn Swallow (*Hirundo rustica*)**

L 6 <sup>3</sup>/<sub>4</sub>" Swallow with the deepest forked tail and long, slender wings. This bird has a blue back and cinnamon-colored underparts. It builds nests on or inside buildings and under bridges. Feeds exclusively on insects while flying – up to 6,000 a day.



**Black-capped Chickadee (*Parus atricapillus*)**

L 5 <sup>1</sup>/<sub>2</sub>" Small bird with black cap and bib, rusty sides and white cheek patch. Chickadees nest in tree cavities and nest boxes and are easily attracted to feeders. Year-round resident who feeds on insects in summer and fruit and seeds in winter. Found throughout the United States in wooded habitats.



**Red-breasted Nuthatch (*Sitta Canadensis*)**

L 4 <sup>1</sup>/<sub>2</sub>" Bird has blue/gray back, black cap, white eye-brow, bold black eye line and rusty underparts. Female and juveniles have duller colors. Lives in conifers and can be seen walking face down a tree trunk gleaning insects from bark. Will come to feeders for sunflower seeds and suet.



**American Robin (*Turdin migratorius*)**

L 10" This common bird is dark gray above, with a darker head and tail and brick-red underparts. Often seen on lawns, with head cocked as it searches for worms. Also eats insects and berries.



*(Continued on page 16)*

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**Cedar Waxwing (*Bombycilla cedrorum*)**

L 7 ¼” This beautiful bird has a crest, black mask across eyes, pale yellow belly, red spots on wings, and Yellow band on end of tail. Nests in open habitat and often seen foraging for food in small flocks. Feeds on various berries: cedar, mountain ash, twin-berry, *Pyracantha*. Also feeds on insects, flower petals and sap.



**European Starling (*Sturnus vulgaris*)**

L 8 ½” Adult in breeding plumage is iridescent black With a bright, yellow bill. In fall, feathers are tipped with white or buff, making it look speckled, and bill becomes brown. Introduced in the U.S. in 1890. This bold, aggressive bird often takes nest sites from other bird. Imitates the songs of other bird species and, in captivity, is easily trained to talk. Eats a variety of insects, seeds and fruit.



**Common Yellowthroat (*Geothlypis trichas*)**

L 5” This small, stock bird has a broad, black mask and bright yellow throat. Found in marshy or brushy vegetation near water, but rather secretive. Song sounds like *wichety, wichety, wichety*.



**Spotted Towhee (*Pipilo erythrophthalmus*) (previously Rufous-sided Towhee)**

L 8 ½” Male has black upper parts and black hood, which contrasts with dark, rust-colored flanks and white under parts. White wing patches and white-cornered tail are conspicuous in flight. Common in dense undergrowth, forest edges and open woodlands. Forages on ground. Towhees scratches noisily through dead leaves but may be difficult to see.



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**Song Sparrow (*Melospiza melodia*)**

L 6 ¼” All subspecies have long, rounded tail, which bird pumps in flight. All show broad, grayish eyebrow and broad, dark stripe bordering whitish throat. Streaking on breast converges in a central spot. Legs and feet are pinkish. Forages in brushy areas and forest understory and edges. Year-round resident.



**White-crowned Sparrow (*Zonotrichia leucophrys*)**

L 7” Black and white-striped crown; pink or yellowish bill, whitish chin and gray underparts. Common in open woodland, brushy grasslands, roadsides and parks. Eats Insects.



**Dark-eyed Junco (*Junco hyemalis*)**

L 6 ¼” Juncos are small, slender sparrows with gray or black hoods and striking white outer tail feathers, often seen when they fly. Often seen in flocks, they hop along the ground and pick up small seeds. In winter, easily attracted to feeding stations.



**Red-winged Blackbird (*Agelaius phoeniceus*)**

L 8 ¾” Male is a glossy black with red shoulder patches, broadly tipped in yellow. Females are dark brown above and heavily streaked below. Generally nests in fresh water marshes. Forages in fields, orchards and woodlands. Congregates in large flocks in winter.



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**House Finch (*Carpodacus mexicanus*)**

L 6" Male is brown/gray on back with indistinct streaks; lighter and more streaked on belly. Face and breast are orange-red, which is brightest on forehead and malar. Female is gray/brown overall with indistinct streaks. House Finch has slightly notched tail and short bill, with curved culmen. Found in open woods and suburbs and is a frequent visitor to feeding stations.



**Pine Siskin (*Carduelis pinus*)**

L 5" These birds have brown streaks all over; yellow at base of tail and flight feathers conspicuous in flight. Bill is thinner than other finches. May flock with goldfinches in winter. Found in coniferous and mixed wood forests in summer; forests, shrubs and fields in winter. Eats seeds and easily attracted to feeding stations.



**Evening Grosbeak (*Coccothraustes vespertinus*)**

L 8" Large, stocky, noisy finch with large bill. Black tail and wings, with prominent white wing patch and yellow undercoverts and supercilium. Bill is pale yellow, except in spring when it is green. Female is grayish tan with white wing patch. Breeds in mixed woods, mainly in the mountains. Flocks will frequent feeders in winter.



**House Sparrow (*Passer domesticus*)**

L 6 ¼" Male in breeding plumage has gray crown, chestnut nape, black bib and black bill. Female is less colorful with a streaked back, wide eye stripe and plain breast. An introduced species, this bird is abundant and aggressive and often seen in urban settings.



**TEACHER  
RESOURCE  
PAGE**

## REASONS WHY BIRDS ARE IMPORTANT

Birds:

1. Beautify our world.
2. Entertain us with their antics and songs.
3. Disperse seeds.
4. Pollinate flowers.
5. Fill a niche in the food chain as predator and prey.
6. Help to control the insect population.
7. Serve as an indicator species. The types of birds and their numbers can give scientists a good indication of the health of an ecosystem.

**TEACHER  
RESOURCE  
PAGE**

## HOW CAN WE HELP BIRDS?

1. Put up bird feeders.
2. Provide nest boxes.
3. Provide water.
4. Restore habitat.
5. Make better consumer choices:
  - a. Buy shade grown coffee and chocolate.
  - b. Don't buy mahogany, teak and other woods that come from countries that are being deforested.
  - c. Plant native species.
6. Create wildlife habitat.
7. Support good land use planning for wildlife by supporting local and national legislation.
8. Participate in citizen science projects:
  - a. Project Feeder Watch.
  - b. Christmas Bird Counts.
  - c. Washington Department of Fish and Wildlife: Nature Mapping.
  - d. National Wildlife Federation: Backyard Wildlife Sanctuary Program.
  - e. Great Backyard Bird Count: February.
9. Join a conservation organization.
10. Limit use of pesticides.
11. Keep your cat indoors.
12. Share your passion for birds.
13. Volunteer to work at a nature center or wildlife refuge.
14. Birdscape your yard. Plant trees and shrubs that provide food and shelter for birds
15. Take injured birds to a wildlife care center.
16. Keep birds away from airports, tower guy lines, etc.

**TEACHER  
RESOURCE  
PAGE**

## CONSERVATION THREATS

1. Loss of habitat.
2. Habitat fragmentation.
3. Brood parasites.
4. Predators.
5. Exotic species.
6. Pollution.
7. Illegal hunting.
8. Climate change.
9. Human-made structures.

# ACTIVITIES

## INTRODUCTION TO EDUCATIONAL ACTIVITIES

Now that you have read the background information, you are ready to get started. The pages that follow are filled with activities that we hope you and your students will find fun and educational. Go for it!

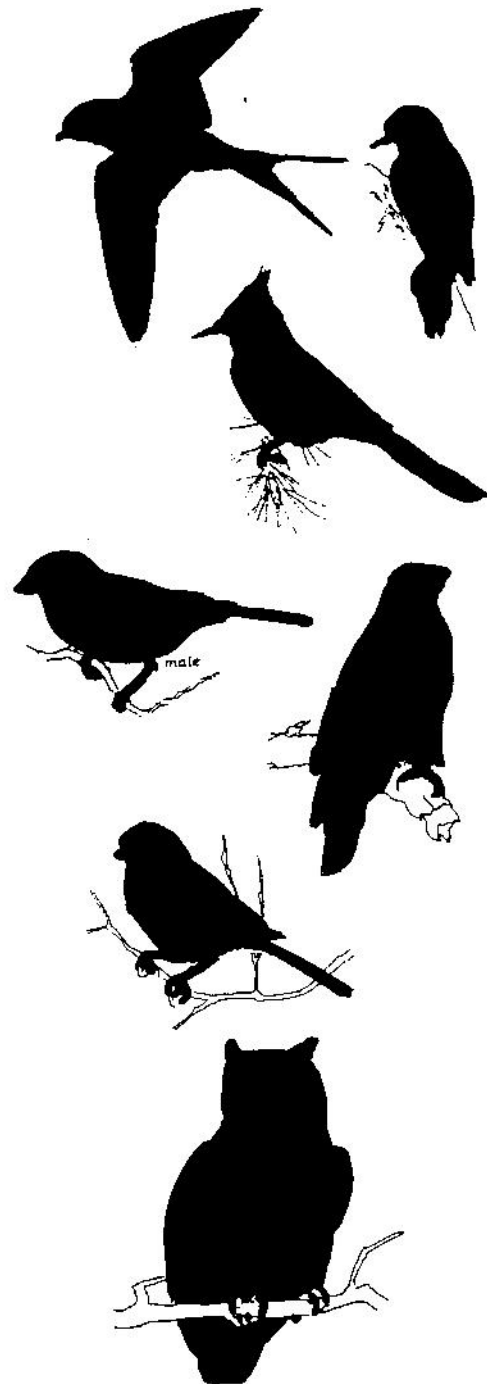
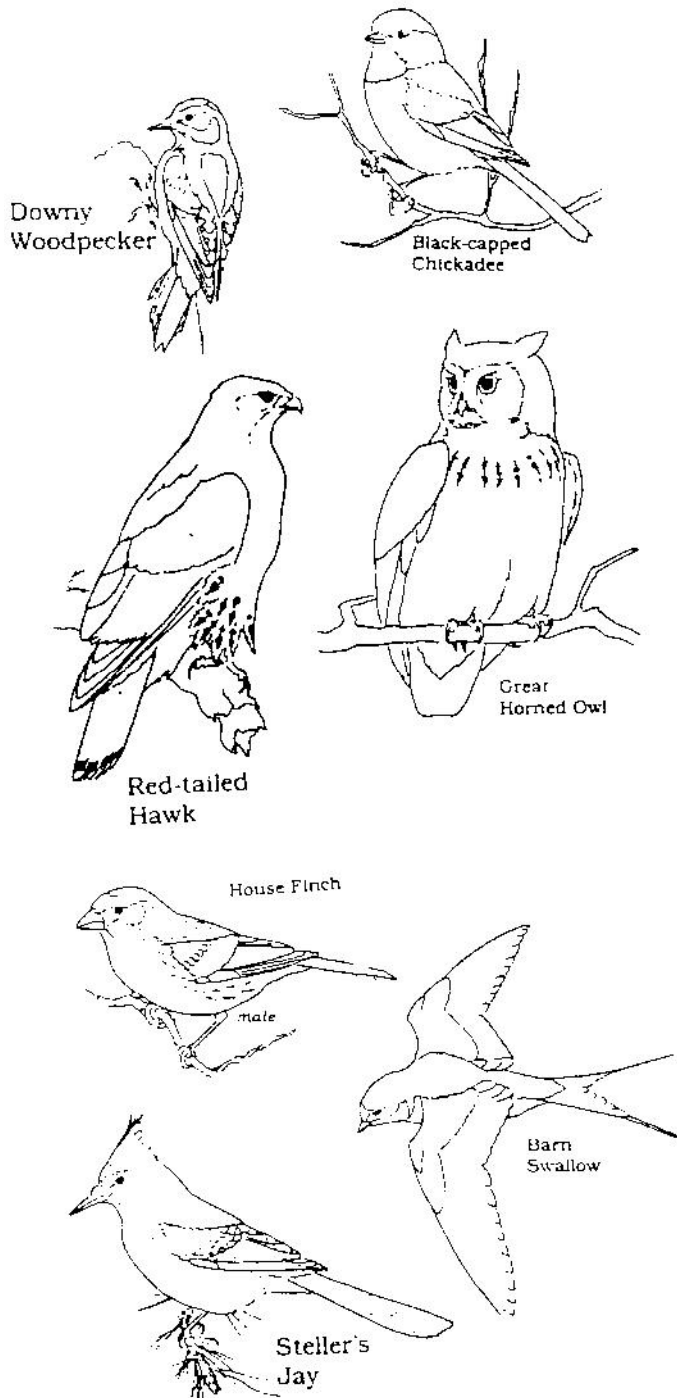
If you are interested in learning more about the physiology of birds, we suggest you read *Birds: The Inside Story*. It is included in the Bird Box.

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Classroom grades K—6

## BIRD SHAPES

*Match the bird to the silhouette*



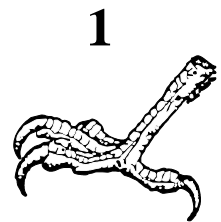
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Classroom grades K—6

## BEAKS AND FEET CHALLENGE

The pictures below represent the beaks and feet of four different types of birds. Each bird has specially adapted a beak and feet that allow it to feed in a specific habitat (e.g. wetlands, woods, lakes, etc.) Using the clues provided for each bird, match the beak to the correct food. After matching the beak and foot, write down the name of the habitat where you think this bird lives.

The flycatcher perches in trees and catches insects; its foot is adapted to clutch branches. The flycatcher's foot is number:



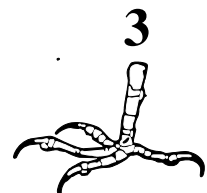
Habitat: \_\_\_\_\_

The Mallard has a special flat beak that strains small plants and animals from the water as it swims. The Mallard foot number is:



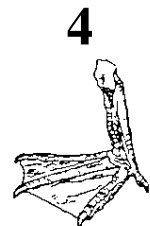
Habitat: \_\_\_\_\_

The hawk captures prey with its long, sharp claws (talons) and tears meat with its beak. The hawk foot number is:



Habitat: \_\_\_\_\_

The Long-billed Curlew probes mudflats with its long beak in search of small animals. Its long legs and toes help it maintain its balance as it wades through shallow water. The curlew's foot number is:



Habitat: \_\_\_\_\_

## ACTIVITY

### WHAT CAN I EAT WITH THIS BEAK?

#### *Background*

Our backyards and schoolyards provide many birds with homes (habitat). They are all able to live here because their beaks have adapted for different feeding techniques. Hundreds of organisms (worms, insects, seed, snails, slugs) that birds eat live in backyards.

#### *Methods*

Ask the students to sit in a circle or two lines facing each other. Begin the activity with a general discussion about bird beak types. What kind of beaks have they seen? (Long pointy, short, wide, etc. ) Explain that bird beaks are adapted to match the type of food they eat. For example, many birds have tweezer-like beaks. A bird with a short "tweezer" beak eats animals near the surface of the ground, whereas a bird with a long "tweezer" beak can reach animals that burrow deeper. Some birds with scissor-like beaks have clothespin-shaped beaks that are excellent for crushing the hard covering of seeds. Lastly, birds may have spoon-like beaks that can scoop up large numbers of small fish or strain plant material from mud. The different diets of birds allow them to live in the same area at the same time (coexist). This is why you may see many types of birds feeding together in one area.

Hold up the beak utensils one at a time and ask the students for examples of birds with a beak similar to the utensil. Some potential answers are in the chart on the second page.

After your bird beak discussion, introduce the students to the activity by having them imagine that they are a flock of birds (think about your wings, feet, beak, etc.) Explain that the area between them represents their habitat. Ask them to choose what type of habitat they will feed in (marsh, slough, lake).

#### **CLASSROOM**

**Grades: K-8**

#### **Objective**

*Students will learn how different behaviors and feeding habits allow several types of birds to live in the same habitat at the same time.*

#### **Materials**

*1 small paper cup per student (bird stomach)*

*Chalk, board or easel, or paper for data chart*

*Food: provide an adequate food supply for all students, i.e. marbles (snail), cut up pipe cleaners (worms) 3/16 metal washers (beetles)*

*Beak types: spoons, scissors., tweezers, and clothespins (one beak per student)*

*Time: 30 minutes*

*What Can I Eat With This Beak (cont.)*

Hand a "stomach" (cup) and one "bird beak" to each "bird" (student). Explain the following rules.

1. "Birds" must pick up their food, using only their "beaks", and put it into their "stomachs."
2. Food may not be scooped or thrown into the stomach. "The stomach" must be held upright.
3. "Birds" can only feed when given permission to do so.

Distribute one type of food evenly within the habitat. Give the birds permission to leave their nests and feed. Allow the birds to feed for 1 or 2 minutes and then tell them to stop feeding and return to their nests. Have similar type beaks get together to count the total amount of food they collected; record their results on the data sheet. If possible, use room lights to designate day (feeding time) and no room lights – night (resting time).

Repeat the feeding steps for each food item. For a more natural situation, mix all three food items; an area seldom has only one type of food. Before feeding ask the birds what they will be eating. You may facilitate this discussion by sharing the following ideas: birds should first eat the food they can gather the easiest (as they found out in the earlier rounds) and then switch to a secondary food item as it gets harder to find their first choice. Record the data. Try to correlate the simulation with real world examples.

The teacher is a hawk that eats birds. Unusual behavior of a bird draws attention, so a predator will notice the bird and eat it. Unruly behavior or violations of the rules result in the hawk capturing the conspicuous bird and making it sit out for one round. After recording all the data, collect the beaks and food.

*Discussion*

Q: Are some beaks better at eating a particular food item than other beaks?

A: Yes.. look at the data chart and compare the number of each food eaten to determine what each beak type eats the best.

Q: What other parts of a bird are important to its feeding success?

A: A bird's legs and feet are adapted for living and feeding in a specific habitat. Some birds have long legs and wide feet for wading and searching for fish while others have webbed feet for swimming and diving or short clawed feet for catching prey.

Q: In which habitat does each beak type forage for its food?

A: Tweezers in mud (shorebirds) or field (hummingbird).. scissors in field (raptors)... spoon in slough or pond (duck;.. pelican)... and clothespin in upland or marsh (wren).

Q: What differences did you notice in feeding behavior when all food items were passed out?

A: More relaxed, less fighting for food because there was enough for all birds.

**ACTIVITY**

**EXAMPLES OF BIRDS TO MATCH BEAK TYPES**

*Spoon Beak*

Blue-winged Teal  
Northern Shoveler  
Mallard  
White Pelican  
Roseate Spoonbill

*Clothespin Beak*

American Goldfinch  
Marsh Wren  
House Finch  
Steller's Jay  
Chickadees

*Scissor Beak*

Perching birds  
Northern Harrier  
Caspian Tern  
American Kestrel  
Great Horned Owl

*Tweezer Beak*

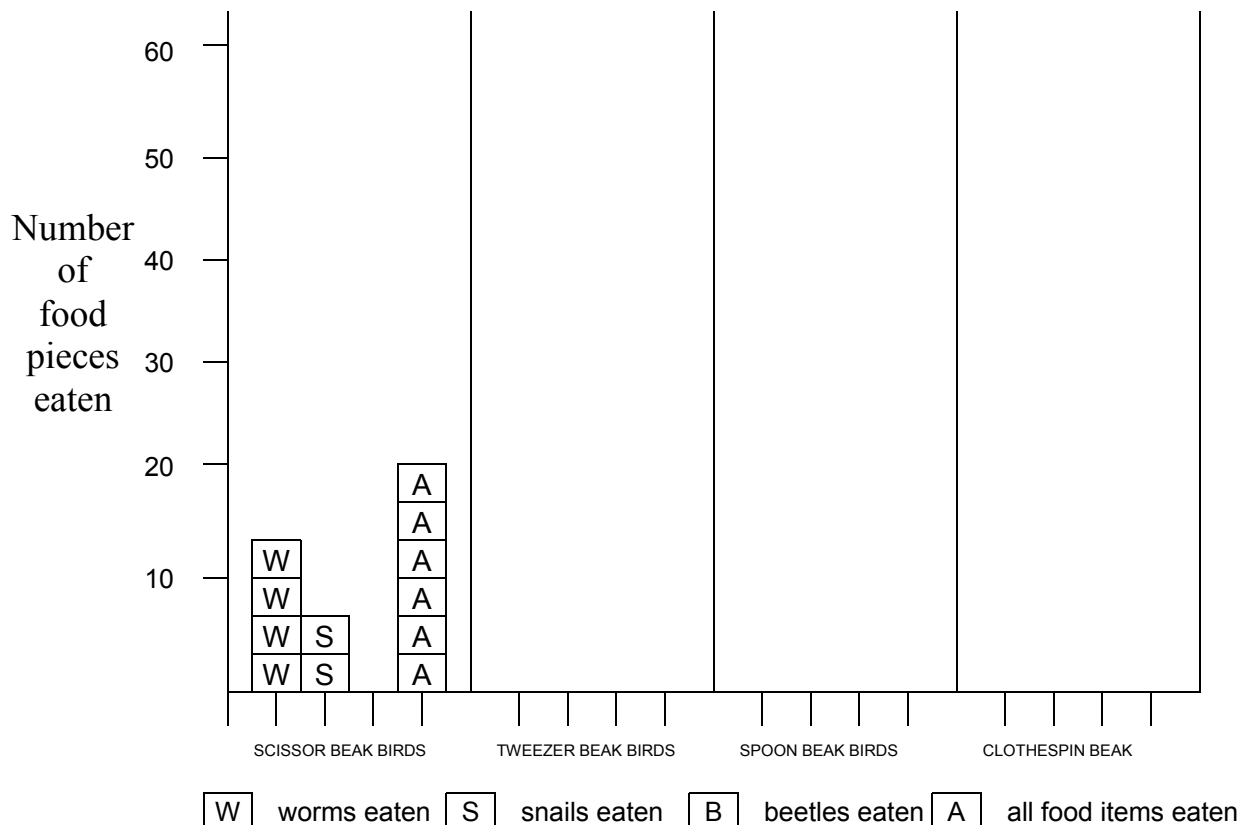
Kingfishers  
Great Blue Heron  
Hummingbirds  
Dowitcher

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**WHAT CAN I EAT WITH THIS BEAK?**

FOOD BEAK TYPE	WORMS	SNAILS	BEETLES	ALL FOOD TYPES
SCISSORS				
TWEEZERS				
SPOONS				
CLOTHESPINS				

**Extension:** The graph below suggests an additional graphing exercise for use in your class-room.



**ACTIVITY**

## ADAPTATION ARTISTRY

### *Background*

Birds have a variety of adaptations -including characteristics of beaks, feet, legs, wings and coloration. These adaptations have evolved so that the bird is better suited to its environment and lifestyle. A variety of major adaptations are listed on a separate page:

### *Methods*

Students design and create imaginary birds, and write reports including descriptions of the birds' adaptations.

### *Activity goals for the students:*

1. To realize that there are advantages for birds in looking how they do.
2. To recognize some of the ways in which birds are physically adapted to their environments.

### *Procedure*

1. Discuss with the students the various adaptations given in the background section of this activity, listing the adaptations on a chalkboard for reference by the students. Or, brainstorm a list of bird characteristics, name the birds with such characteristics, and describe the advantage of the adaptation represented by the characteristic.
2. Tell the student they will each have a chance to design their own original bird—one well-adapted to its habitat. Each student should decide:
  - where the bird will live
  - what it will eat
  - its type of mobility
  - its sex
3. Based on these choices, the students will decide the adaptations that are necessary for their bird and write them down before proceeding further.

### **CLASSROOM**

#### **Grades: 4-9**

### *Objective*

*Students will be able to:*

*Identify and describe the advantages of bird adaptations.*

*Evaluate the importance of adaptations to birds.*

### *Materials*

- ◆ *drawing, painting, clay sculpture or paper mache materials*
- ◆ *construction paper and glue*
- ◆ *pencil and paper*

*Time: 45 minutes*

*(Skills: analysis, application of concepts, description, discussion, drawing, invention, media construction, observation, problem solving, reporting, synthesis, writing)*

**ACTIVITY**

## HOW TO LEARN TO IDENTIFY BIRDS EVEN IF YOU DON'T KNOW A SINGLE THING

### *Method*

Using the slides that are provided in the box, look at the first six slides. Have the names at your side, and look at the birds. You will probably discover that remembering the names of these birds is really quite easy. Then, look up each of the birds in one of the field guides in the Bird Discovery Box. Read the text about the bird and look carefully at the drawing or photo. Learn what markings or features make each bird different from another. What habitat does it live in? What is its shape?

Options:

- ◆ Have students help you look up information in field guide.
- ◆ Look information up before giving lesson.
- ◆ Use the flash cards provided.

To keep it simple and quick: choose two field marks (identifying visual characteristics) that you can talk about to help students remember the bird. For example, for a Black-capped Chickadee you can use:

Black cap and white cheeks.  
Can hang upside down on branches.

Either the teacher or the student can find at least one fact about the bird in a bird guide, such as the way the bird flies, or a kind of noise it makes. Have the students record these in a notebook.

### **CLASSROOM**

**Grades: K-12**

### *Objective*

Students will be able to identify thirty backyard birds

### *Materials*

- ◆ slide projector
- ◆ set of slides in BIRD DISCOVERY BOX
- ◆ at least one field guide that comes with the box: Birds of North America; National Geographic Society; A Field Guide to the Birds, R.T. Peterson
- ◆ resource book: Birds: The Inside Story, VAS
- ◆ notebook for each child

Time: one 30-minute and two 15-minute sessions per week, for 5 weeks

*(Continued on page 10)*

*(Continued from page 9)*

### **Procedure**

Below find two possible teaching scenarios. The first one is more teacher directed, and the second is more student directed.

Here is an example of how to learn 30 birds, six at a time:

- ◆ Monday: Introduce the first 6 birds
- ◆ Wednesday: Do a quick review.
- ◆ Thursday: Another review of necessary
- ◆ Friday: Give a quiz. *Repeat this procedure each of the five weeks.*

To be more specific, on Monday write the name of the first bird on the board and have students copy it into their notebooks. Ask students to help point out

field marks, write them in their notebooks and draw the bird in their notebooks. Follow this procedure with the remaining five birds. Show the slides of the six birds three or four times in succession, having students volunteer to identify them.

The next step is to practice in the field. Use the binoculars furnished in the box, and/or borrow some from the school district, parents, etc. Practice using the binoculars with the activity Binocular Warm Up. Now you are ready to go on a field trip. You may go to a special place such as Juanita Bay Park or a nature trail, or simply take a walk around the school neighborhood. The best way to ensure that everyone is participating is to give them a checklist or data-

This lesson was adapted from “Spawning Junior Naturalists” by Stephen Cramer, Science specialist for the Partnership in Elementary Science Education.

**ACTIVITY**

## BINOCULAR WARM-UP

### *Method*

1. Divide students into teams of two or three depending on availability of binoculars and field guides.
2. Have students stand abreast in lines of two with their partner behind them. They should face the instructor. Instructor explains how to focus the left eye, then the right eye, and use of the focus ring or bar on the binoculars.
3. Instructor holds up an opened field guide and asks the first person in each line to:
  - a. Look at the opened page first without binoculars.
  - b. Without losing sight of the book, quickly put their binoculars up to find the field guide and focus.
  - c. When student can identify the bird on the upper right-hand corner of the right page, they should hold up their hand quietly.
4. Have students trade binoculars with their partner and try again using a different page of the field guide.
5. Do this several times until each person in the group has successfully figured out the use of the focus bar or ring on the binoculars.

### *Notes*

- ◆ Use pages in the field guide that have fairly common birds, e.g., robin, woodpecker, owl, goose, swan.
- ◆ You can help students use the field guide by knowing page numbers for waterfowl and by showing them how the index at the back of the field guide works.
- ◆ Have each team record the bird species and numbers seen and compile a class total.

### **CLASSROOM or OUTDOORS**

**Grades: 4 – 6**

### *Objective*

To promote successful use of binoculars and field guides as a tool to identify birds in the field.

### *Materials*

- ◆ binoculars
- ◆ at least one field guide that comes with the box: *Birds of North America*, National Geographic Society; *A Field Guide to the Birds*, R.T. Peterson

Time: 10 to 15 minutes

**ACTIVITY**

**LET'S GO BIRDING**

**Background**

Background material in the preceding materials.

**Procedure**

1. Choose a spot to observe. (Remember to listen to locate the birds).
2. Walk 200 meters.
3. Stop.
4. Observe and record data for 6 minutes.
5. Continue to walk another 200 meters.
6. Each stop is considered a point.
7. Number your points.

**OUTDOORS**

**Grades: 4 – 9**

**Objective**

Students will be able to:  
 Learn observation skills  
 Learn to collect data  
 Observe birds in their natural habitat

**Materials**

- ◆ Binoculars
- ◆ Notebook
- ◆ Field Guide (i.e., Birds of North America, National Geographic Society; A Field Guide to the Birds, R.T. Peterson; Audubon Student Guide)

Time: 10 to 15 minutes

Example of recording information:

<b>POINT (STOP)</b>	<b>TIME</b>	<b>NAME OF BIRD</b>	<b>HABITAT</b>	<b>BEHAVIOR</b>
<i>1</i>	<i>10:30 a.m.</i>	<i>Steller's Jay</i>	<i>Conifer tree</i>	<i>Squawking in tree</i>
<i>1</i>	<i>10:32 a.m.</i>	<i>Black-capped Chickadee</i>	<i>Conifer tree</i>	<i>Hammering trunk</i>
<i>2</i>	<i>10:37 a.m.</i>	<i>Oregon Junco</i>	<i>Under bushes</i>	<i>Looking for food</i>
<i>2</i>	<i>10:40 a.m.</i>	<i>Bewick's Wren</i>	<i>In bushes</i>	<i>Scolding</i>

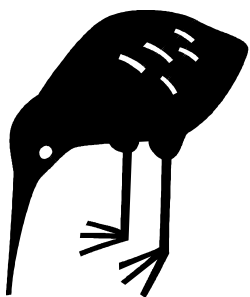
This lesson was developed by the NTEP Board Team with lab scientist, Dave Keller, Los Alamos National Laboratory—Science Education and Outreach Office

**ACTIVITY**

## HOW TO LEAD A SUCCESSFUL BIRD WATCH OR (How to succeed in birdwatching without really trying)

Every subject requires its own special teaching techniques, and bird watching is no exception. Many a field trip has been lost because the leader was not aware of the special techniques for handling groups in the out-of-doors. Here are some pointers for leading a group of kids on a birdwalk.

1. Be enthusiastic. Don't worry if you don't know about the birds.
2. Try to keep the group as small as possible. Four to six is an optimum size.
3. Make sure everyone stays close together. This prevents rapid movements when a bird is spotted and also helps keep the group in touch with the leader.
4. Move slowly. This will enable you to see more. How much can you see when you're moving down the freeway at 60 mph? In addition, moving slowly will not scare the birds.
5. Watch the trees for movement. Birds usually move around a lot, and you can take advantage of this by letting your eyes go out of focus and scanning large areas with one glance. Your peripheral vision will pick out movement in the trees much sooner than if you try to focus on specific branches on the tree.
6. Use your ears. Birds will often give themselves away by calling or singing. A noisy group will not be able to hear sounds as well as a quiet group. Noise doesn't necessarily scare birds away.
7. When you spot something – stop.
8. Avoid making sudden movements if the bird is close by. Pointing it out with your arm might just scare it away.
9. There is a trick for attracting birds – which is sometimes effective: Make a loud “pshh pshh” through your teeth. Some birds will come within a few feet if you are absolutely still.
10. Be discreet – birds are shy.
11. Vary the speed of your walk to keep students' interest.
12. Before you go out bird watching, assign various students into groups to be “experts” in each of the various types of bird groups. For example, one group may be “hawk experts,” another may be “duck experts,” another “sparrow experts,” etc. During the field trip, divide the experts so that each group has an expert on sparrows, on ducks, on hawks, etc.
13. Use a checklist, or make one as you go along.
14. Encourage students to use the field identification guides, if you have them. Resist being an authority by saying, “that's a so-and-so” and “there's a such-and-such.”
15. While watching the birds, try to answer some of the questions about what they are doing, where they're going, etc.
16. Time of day makes a difference in what birds you will see. Early morning is best, before sunset is next best, and middle of the day is the worst time.
17. Invite a parent or other adult who is interested in birds to come along. Bird watchers are everywhere. Chances are there is one in your class somewhere.



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**BIRD IDENTIFICATIONS  
ACCORDING TO SIBLY**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Name of Species	Audubon Pocket Guide Page No.	Name of Species	Audubon Pocket Guide Page No.
Western Grebe		Northern Flicker	
Pied-billed Grebe		Stellar's Jay	
Double-crested Cormorant		American Crow	
Great blue Heron		Barn Swallow	
Canada Goose		Black-capped Chickadee	
Mallard		Red-breasted Nuthatch	
Green-winged Teal		American Robin	
Red-tailed Hawk		Cedar Waxwing	
Bald Eagle		European Starling	
American Coot		Spotted Towhee	
Killdeer		Song Sparrow	
Rock Pigeon		Dark-eyed Junco	
Barn Owl		Red-winged Blackbird	
Great Horned Owl		House Finch	
Rufous Hummingbird		Pine Siskin	
Belted Kingfisher		Evening Grosbeak	
Downy Woodpecker		House Sparrow	

Name: \_\_\_\_\_  
 Habitat: \_\_\_\_\_  
 Shape/Size: \_\_\_\_\_  
 Call/Noise: \_\_\_\_\_  
 Beak: \_\_\_\_\_  
 Feet: \_\_\_\_\_  
 Nesting: \_\_\_\_\_

Name: \_\_\_\_\_  
 Habitat: \_\_\_\_\_  
 Shape/Size: \_\_\_\_\_  
 Call/Noise: \_\_\_\_\_  
 Beak: \_\_\_\_\_  
 Feet: \_\_\_\_\_  
 Nesting: \_\_\_\_\_

Name: \_\_\_\_\_  
 Habitat: \_\_\_\_\_  
 Shape/Size: \_\_\_\_\_  
 Call/Noise: \_\_\_\_\_  
 Beak: \_\_\_\_\_  
 Feet: \_\_\_\_\_  
 Nesting: \_\_\_\_\_

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*Bird Identifications (Cont.)*

Name: \_\_\_\_\_  
Habitat: \_\_\_\_\_  
Shape/Size: \_\_\_\_\_  
Call/Noise: \_\_\_\_\_  
Beak: \_\_\_\_\_  
Feet: \_\_\_\_\_  
Nesting: \_\_\_\_\_

Name: \_\_\_\_\_  
Habitat: \_\_\_\_\_  
Shape/Size: \_\_\_\_\_  
Call/Noise: \_\_\_\_\_  
Beak: \_\_\_\_\_  
Feet: \_\_\_\_\_  
Nesting: \_\_\_\_\_

Name: \_\_\_\_\_  
Habitat: \_\_\_\_\_  
Shape/Size: \_\_\_\_\_  
Call/Noise: \_\_\_\_\_  
Beak: \_\_\_\_\_  
Feet: \_\_\_\_\_  
Nesting: \_\_\_\_\_

Name: \_\_\_\_\_  
Habitat: \_\_\_\_\_  
Shape/Size: \_\_\_\_\_  
Call/Noise: \_\_\_\_\_  
Beak: \_\_\_\_\_  
Feet: \_\_\_\_\_  
Nesting: \_\_\_\_\_

Name: \_\_\_\_\_  
Habitat: \_\_\_\_\_  
Shape/Size: \_\_\_\_\_  
Call/Noise: \_\_\_\_\_  
Beak: \_\_\_\_\_  
Feet: \_\_\_\_\_  
Nesting: \_\_\_\_\_

Name: \_\_\_\_\_  
Habitat: \_\_\_\_\_  
Shape/Size: \_\_\_\_\_  
Call/Noise: \_\_\_\_\_  
Beak: \_\_\_\_\_  
Feet: \_\_\_\_\_  
Nesting: \_\_\_\_\_

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**OUTDOORS  
Grades: 3-6**

**BIRD BINGO**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Find a bird soaring high in the sky.	Name a bird feeding on a lawn.	Find a bird that is feeding. What is it eating?	Find a bird hanging on a tree branch. What is it doing?
Name an animal that birds would catch in the grass.	Find a bird that is blue. Can you name it?	Find some bird tracks and draw them.	Listen for a bird that is singing. What does it sound like?
Find a bird on a tree trunk. What is it doing?	Find a bird larger than a robin. What does it look like?	Find a bird that is preening.	Find a bird at a bird feeder.
Find a bird smaller than a robin. What does it look like?	Find a bird's nest.	Find a bird that is brown with a pink head. What is its name?	Draw a bird that you see.

**ACTIVITY**

**NEIGHBORLY BIRDS**

There may be many kinds of birds that live in your neighborhood. How many are there? How are they alike? How are they different? Do they live in your neighborhood all year long, or do they leave during a certain season? These are some of the questions that you may want to answer with your research project.

*STATING THE PROBLEM -THE BIG QUESTION*

Your research will not require you to form an experiment, but it will require you to make and record many observations. Write at least three questions about what you want to learn from your research on the various kinds of birds that live in your neighborhood.

*FORMING A HYPOTHESIS- A SMART GUESS*

Before you gather your data, are there any predications that you want to make? Your prediction, or hypothesis, could be about the kinds of birds, number of birds or most common kind of bird in your neighborhood. Or you could predict when a certain kind of bird will migrate from your area. Write at least three predictions.

*PLANNING THE PROCEDURE*

There are many things that you have to know about birds before you can make an inventory of the birds in your neighborhood. Find at least two books that will help you identify birds in your area. Keep the books with you when you are observing.

Where in your neighborhood should you go to watch birds? Find a place where birds gather.

What information will you record? Design a chart to record your observation data, such as the chart below:

<b>Date</b>	<b>Time</b>	<b>Bird</b>	<b>Location</b>

**OUTDOORS**

**Grades: 4 – 8**

*Objectives*

*Students will be able to:*

- *make and record observations of birds*
- *use field guides to confirm observations*
- *learn to analyze data*
- *begin to learn the scientific process*

*Materials*

*Paper  
Pencil  
binoculars*

*Time: 1 hour observations  
two times per week from September through May*

*Neighborly Birds (Cont.)*

*RECORDING RESULTS*

Collecting data can be the most exciting part of your project. Maybe you'll see a very uncommon bird. It's important to keep very accurate records and to not miss a day. You might find it helpful to keep a piece of paper and a small pencil in your pocket, just in case you see a rare bird on your way to and from school.

*DRAWING A CONCLUSION*

Look back at the predictions that you made before you began to collect your data. Carefully analyze your records. Did you find some of your predictions to be true? Did you see any unusual patterns in your observations? Maybe you noticed when a new bird started to regularly visit your yard. Or did you notice when a regular visitor failed to return?

Write a short report explaining what you have found through your research and observations. Your report should answer the Big Questions you asked.

*DISPLAY*

Display the information that you have found. You should include your predictions, data and conclusions. Pictures of some of the birds you observed, your records, charts on migration patterns and other information about birds which you discovered in your research would also add interest to your display.

# BIRD SONGS

TEACHER  
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## WHY BIRDS SING

Birds have two vocal functions: calls and songs.

*Calls* serve a specific function and are innate. They can be alarm calls or contact calls. For some birds like gulls and parrots, this is their only form of communication. *Songs* are more developed and at least partially learned. Males can sing two or more songs (repertoire). Songs fulfill four purposes:

1. to identify their own species.
2. to proclaim territory.
3. to attract a mate.
4. to stimulate nest building and egg laying.

How do birds learn their songs?

Most songbirds learn their repertoire (or songs) from adult tutors. The songs that they sing can have dialects like people. The song is different from its call which is much shorter.

Some birds mimic the songs of other birds.

Some examples of these birds are: Northern Mockingbird, European Starling, and Steller's Jay. They may mimic to expand their own repertoire or to improve their ability to attract a mate or intimidate rivals.

A bird's brain has a song control area. The larger this area the more repertoires the bird sings.

Refer to *Western Bird Songs* by Peterson in the Bird Discovery Box.

TEACHER  
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## HOW TO LEARN BIRD SONGS

To be a good birdwatcher, you must learn to act like a predator. You must become part of the bird's world by becoming attuned to your surroundings with all your senses. Walk with an alertness and an expectation. Watch for the slightest movement from the ground level on up! Birds may be found on the ground, in the bushes, on tree trunks, in the branches, on snags and at the tops of trees. Birds can also be found on power lines and other man-made structures. Some birds of prey even do mating dances at high altitudes.

Many experienced bird watchers can recognize most birds by sound as well as by sight. There are several ways to learn how to identify the songs of songbirds. Several different audio tapes are available at local bird supply shops to make the task easier. *Western Bird Songs* by Peterson is included in this box for your use.

### ***Procedure***

There are two methods that can be used to connect the song with the bird:

While you are listening to the song tape also look at a picture or slide of the bird that is singing. Repeat this several times.

Listen to the bird's call and song when you are outside bird watching. When you hear a song, seek out the bird that is singing. Repeatedly seeing the bird and hearing its song in the field will help you remember even more than looking at pictures alone. Use the pictures, slides, and CD enclosed to learn a few songs.

Some birds make sounds that we can imitate by putting words to the sounds or by imagining that the bird is saying his name. Some examples of these calls are:

1. Black-capped Chickadee: chick-a-dee-dee-dee, chick-a-dee-dee-dee
2. Killdeer: kill dee, kill dee
3. Robin: cheerily cheerio, chreeily cheerio
4. Spotted Towhee: towheeeeeee, towheeeeeee
5. Crow: caw, caw, caw
8. Northern Flicker: wick, wick, wick, wick
9. Scrub Jay: jay eeeeeee
10. Barred Owl: who-who-who-who-cooks~for-you .

### ***Extension***

After listening to song tapes, enjoy putting silly words or nonsense words phonetically in place to mimic the cadence or spacing of bird sounds.

**ACTIVITY**

## CALLING ALL BIRDS

### **Background**

How do birds find a mate of the same species? Birds identify each other through their songs. A keen sense of hearing is critical for the survival of their species. If birds cannot find a mate, no young birds are produced to replace the old birds that die or are eaten by predators.

### **Methods**

Before passing out the canisters, discuss the following question: Why do birds sing or call? (*To attract mates, to alarm others about danger; and to establish territory*)

After the question has been thoroughly discussed, give each student a canister. Explain that this is their song, and they are to find another bird with the same song by shaking their canister. For a group of 10 to 20 students, allow 5 minutes to find each other. For a larger group, allow 7 or 8 minutes.

When students think they have found their partner, have them stand together. When the time is called have them open their canisters to see if they have found their partner. Count the number of correct to pairs. Collect the canisters and pass them out again; decrease the amount of time they have to find a partner.

You can play several rounds making each one shorter as the students improve at differentiating the sounds. At the end of the activity, collect the canisters and discuss the questions below. Stop and listen for birds whenever you are outside.

### **OUTDOORS**

**Grades: K – 8**

### **Objective**

*Students will understand how birds call to sound alarms, establish territory, and attract mates.*

### **Materials**

*Pairs of opaque film canisters with different contents (one pair each with the same object)*

*Time: 20 to 30 minutes*

### **Discussion**

Conclude the activity with a discussion about the following questions:

Q: What problems did they experience while trying to find their partners?

*A: Too much noise or not enough time.*

Q: Do wild birds have the same problems?

*A: If there is noise that sounds similar to their call, the birds may have trouble finding a mate.*

# **BEST BIRDING PLACES**

TEACHER  
RESOURCE  
PAGE

## BEST BIRDING PLACES IN URBAN EAST KING COUNTY

The intent of this curriculum is for teachers to use their school yards and neighborhoods for birding. For teachers who may be interested in practicing their skills or for a school field trip, below is a list of other birding sites.

All of these parks have excellent year-round birding opportunities.

**Bellevue Botanical Garden:** 12001 Main Street, Bellevue

**David Brink Park,** 555 Lake Street South, Kirkland

**Everest Park,** 500 Eighth Street South, Kirkland

**Farrel-McWhirter Park:** From Novelty Hill Road, turn onto Redmond Road to Park entrance on left.

**Houghton Park,** 5811 Lake Washington Boulevard, Kirkland

**Juanita Bay Park:** 2201 Market Street, Kirkland

**Kelsey Creek Community Park:** 13204 S.E. Eighth Place, Bellevue

**Lake Hills Greenbelt:** In Bellevue, there are trailheads at 148<sup>th</sup> Avenue S.E. and S.E. Sixth Street, at 156<sup>th</sup> Avenue S.E. just north of S.E. 24<sup>th</sup> Street, and at 156<sup>th</sup> Avenue S.E. and S.E. 16<sup>th</sup> Street

**Lake Sammamish State Park:** Take Exit 15 from I-90, and go east. Follow the signs to the Park. It's located 1.5 miles northwest of downtown Issaquah

**Marsh Park,** 6605 Lake Washington Boulevard, Kirkland

*Birding Sites in Urban East King County (Cont.)*

**Marymoor Park:** From downtown Redmond, go west on Leary Way. Turn left on West Lake Sammamish Parkway N.E. The park entrance is the next left at the traffic light.

**Medina South Park -** From downtown Bellevue go west on N.E. 8th Street, which eventually becomes N.E. 12th Street. Continue west on N.E. 12th Street past 84th Avenue NE to a parking lot on the south side of N.E. 12th. This is the area where there are two ponds and the Great Blue Heron colony.

**Mercer Slough Nature Park:** In Bellevue, there are trailheads at 2102 Bellevue Way S.E., 2810 Bellevue Way S.E. and 1905 – 118<sup>th</sup> Avenue S.E.

**North Creek Park:** Take I-405 to Exit 24 (N.E. 195<sup>th</sup> Street), turn right onto 195<sup>th</sup> Street, and then left onto North Creek Parkway. Park in the parking lot after the second bridge.

**Redmond Watershed Preserve,** Take Avondale Road to Novelty Hill Road. Go east 2.4 miles. The Park entrance is on the north side of the road across from 218<sup>th</sup> N.E.

**Robinswood Park:** 2430 – 148<sup>th</sup> Avenue S.E., Bellevue

**Spiritridge Park:** 16100 S.E. 33<sup>rd</sup> Place, Bellevue

**Totem Lake:** Located at the corner of 124<sup>th</sup> Avenue N.E. and N.E. 124<sup>th</sup> Street, Kirkland. From I-405 exit at Totem Lake Boulevard. Proceed East on 120th Avenue N.E. and turn right on N.E. Totem Lake Way. Street parking is available and the lake is accessible from the motel parking lot.

**Woodlands Park:** At the corner of N.E. 100<sup>th</sup> Street and 124<sup>th</sup> Avenue N.E., Kirkland. Street parking is available on N.E. 100th Street, and the woods are accessible on N.E. 100th Street from just behind the fire station or on the corner of N.E. 100th Street and 128th Avenue N.E.

# **BACKYARD HABITAT**

**TEACHER  
RESOURCE  
PAGE**

## PROVIDING BIRD HABITAT IN THE YARD

You may be asking, "Why do I want to attract birds to my yard?" The answers are many. Bird watching can fulfill many needs for people, especially people who live in the city.

Bird watching is:

- ◆ fun
- ◆ a lifelong hobby
- ◆ a chance to learn identification skills
- ◆ an opportunity to hear and learn bird songs
- ◆ a chance to connect with nature
- ◆ an opportunity to brighten up your life with bird colors and songs
- ◆ a time to reflect on the cycles of life and watch the change in your yard from one season to another

Maybe you will get so excited about these feathery creatures that you will go on birding walks; research where birds go in the winter; join Eastside Audubon; or create a bird habitat. By providing a more diverse habitat, you may be able to attract new species to your yard.

There are many species of wildlife that can live close to humans, especially birds. They can find all their needs in a yard of less than half an acre. Even in an apartment, it is possible to attract some wildlife to a windowsill.

Any species, including humans, has four basic needs: FOOD, WATER, SHELTER, SPACE. If you want to provide a complete habitat, you must provide all these elements. It is not enough to simply provide food if you want birds to stay around. There must be water, cover and space for nesting. If all these elements are not found, a species moves on or dies.

### ***FOOD***

This element of the four basics is the easiest to provide. There are a variety of bird foods sold commercially. You will have better success if you know the favorite foods of birds in your area. In northwest Washington the type of seed most preferred

*Providing Bird Habitat in the Yard (Cont.)*

is black oil sunflower seeds. Providing seed can be done year-round, but is especially needed during nesting and the winter seasons. Suet is also important to provide in the winter, as birds need the fat to give them energy to keep warm.

***WATER***

This is another easy element to provide. Birds will need water for drinking and bathing. Water can be in a bird bath or a pond. A pond is the best way. The pond should be large enough to grow some plants to provide cover, food and reproductive area.

***COVER***

Cover provides protection during bad weather or a place to hide from predators. These same plants can provide food and some reproductive area.

***SPACE***

These are areas where each species can find its requirements met for nests and the safety of its young. Usually this includes mature trees at different heights. Dead wood, such as snags, provide nesting sites for flickers and woodpeckers. If nesting sites are not available, it is possible to attract some nesting birds by providing nesting boxes.

***BIRD FEEDING***

There are two types of supplemental food to offer birds: seeds and suet. Many of our winter residents are seed eaters since this is a food source naturally available during the winter. By offering seeds we are providing supplemental food similar to their basic diet. Suet is a substitute for insects, a food sources that is drastically reduced during the cold winter months. More information on food will follow.

***FEEDING TIPS***

Feed suet during the colder months because it spoils fast in warm weather. Also when insects become active, birds are not interested in suet. If starlings are abundant at the suet feeder, taking the suet down is advised. Starlings are a non-native bird that we do not want to encourage at feeders.

Many people worry that if they begin feeding birds during the winter the birds will become dependent. Current thinking is that this is not a problem. Artificial feeding probably has very little impact on bird populations. In the spring feeding can be a

*Providing Bird Habitat in the Yard (Cont.)*

boost to busy bird parents who need a quick snack while foraging for their young.

Clean feeders every week or two if heavily used to control disease. Disease is usually caused by mold. If mold develops, use a mild bleach solution of one part bleach to 10 parts water.

Store seed in airtight containers to avoid moisture build-up.

Use feeders that are covered or sheltered from the rain and snow and types that don't allow birds to stand on or poop in the seed.

***FEEDERS & NEST BOXES***

Examples of feeders and nest boxes are included in the folder labeled "Nest Boxes", along with plans for building them. Also included are some ideas for ways students can decorate outdoor trees with food for birds in winter.

***LANDSCAPING***

For further information on Naturescaping, call the Washington Native Plant Society at (206) 527-3210. They can give a presentation and also guidance for planting on site. Eastside Audubon has members who can advise you on setting up a feeding station. Call the office at (425) 576-8805.

**COPYCAT  
PAGE**

## BIRD BEHAVIOR EXPERIENCES

1. Try tiptoeing up behind a bird. Remember to go slowly and quietly. What happens? How close could you get? Estimate the number of feet you could get from the bird.

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2. Try making a bird feeder. Hang it close to a window, where you can watch it every day. Each day record how many birds visit the feeder, and what kinds of birds they are.

DAY	NUMBER OF BIRDS	NAMES OF BIRDS
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

**ACTIVITY**

## ENVIRONMENTAL BAROMETER

### *Method*

Students go outside to observe and count or estimate wildlife in an area; do the same in another setting to compare findings; and --optionally--make a school "environmental barometer."

### *Background*

Some species of animals are more adapted to difficult conditions than others. Some, in contrast, are so specialized that it is quite difficult for them to find food, water, shelter and other things they need.

Wildlife serves as an important indicator of the overall health of an area of the environment. If there are few wild animals--or little evidence of wildlife-- present in an area, it is likely that there is little available food, water, or shelter in the area as well. There may not be enough space.

Even if these necessary components of habitat are available, they may not be suitably arranged to meet the needs of wildlife. The kinds of wildlife present are also important indicators. Birds of prey, for example, are high on the food chain. If they are present in an area, that is an indicator that there is some variety of other animals and plants in the area.

The major purpose of this activity is for students to consider the importance of wildlife as an indicator of environmental quality.

### *Procedure*

1. Discuss the diversity of wildlife. Make sure students understand that the term wildlife includes insects, spiders, and other invertebrates, as well as birds, fish, reptiles, mammals and amphibians.

2. Go outside with your students on the school grounds to do a wildlife count. Each student should work alone and have writing materials.

### **CLASSROOM**

**Grades: 3 – 5**

### *Objective*

*Students will be able to:*

*observe and count wildlife in an area;*

*discuss why the wildlife is or is not present;*

*consider ways in which the presence of wildlife can be seen as an indicator of environmental quality.*

### *Materials:*

*Writing materials*

*Poster board or construction paper*

*Time: Two 30-45 minute periods*

*Subjects: science, math, social studies*

*Skills: analysis, classification, comparing and contrasting, computation, discussion, evaluation, observation, synthesis*

*Group size: Any*

*Vocabulary: evidence, wildlife, environmental quality, habitat, barometer*

*(Continued on page 32)*

*Environmental Barometer (Cont.)*

*(Continued from page 31)*

Ask each student to find a spot, sit quietly for ten minutes, and observe. (Quiet is very important to increase the likelihood of seeing wildlife.) The students should record the kinds and numbers of any wildlife they see. They can include evidence of wildlife, in addition to actual sightings. Ask the students to total the number of each kind of wildlife they observe, plus make a grand total. If they find evidence rather than sighting wildlife, they should estimate the numbers. Put all the students' information on one master chart.

Next, take the students to a setting where wildlife is more abundant. Repeat the process – with each student observing quietly for ten minutes and recording observations.

Make a master chart of the information from this second environment.

Compare the information from the two charts. Was there any difference in the two settings? Why or why not? Which environment seemed to have the most different kinds of wildlife? (Where were there the most of any one kind of wildlife – such as the most birds?) What kinds of food, water, shelter, and space were in each setting to support the survival needs of wildlife? If there were few animals – or many – in either setting, what might this tell us about the quality of the environment? What is environmental quality? Can wildlife be an indicator of environmental quality? Talk about whether it is realistic for every environment to be a good habitat for varieties of wildlife. Discuss the possibility and appropriateness of making an effort to improve environments as habitats for wildlife and homes for people too.

**NOTE TO TEACHER:** If there is no significant difference between your observations in the two settings, you can still talk with the students about what this means. You may also choose to make the observations and create the information charts only for one setting, simply analyzing and discussing the quality of the one environment – without using another for comparison.

***Extension***

Make an environmental barometer to indicate the quality of your school environment as a habitat for wildlife. Share your barometer with other classes.

***Evaluation.***

1. Each year, thousands of bird watchers participate in a National Audubon Society bird count all over the United States. The information is kept and compared from year to year, to see if changes occur in the total number of birds, or in how many different kinds of birds are sighted. If a steady and long decrease in the bird populations occurred over a period of five years, should everyone be concerned – and not just bird watchers? Explain your response.
2. Make a list of things we do in cities and towns that tend to decrease the amount and kinds of wildlife that live there. Make a list of things we sometimes do in cities and towns that tend to increase the amount of some kinds of wildlife.
3. Identify and describe three things that people could do to increase the numbers and kinds of wildlife living in an area that has little evidence of wildlife.

**ACTIVITY**

**CAN DO**

**Background**

Each of us can make constructive contributions to improving the environment in which we live.

Sometimes our actions can improve the environment for people, sometimes for wildlife, and sometimes for both. Sometimes our effectiveness can be improved if we work with other people--sharing ideas, information and skills.

A working knowledge of the following terms will be useful to students in this activity.

**Problem**—a difficult situation to be improved, or an opportunity to make things better. Problems can't always be "solved" but situations can usually be improved. **Authority**—an individual or groups of people with the power to make changes. **Compromise** -a way to settle a problem in which both "sides" usually give a little.

Given that it is important for young people to learn that they "can do" for people, wildlife and the environment -use your judgment in the courses of this activity to assist students in selecting a project that is realistic, constructive and possible. If not, the students may experience an activity that contributes to their thinking that they "can't do."

The major purpose of this activity is to provide students an opportunity to experience success in taking constructive actions to improve the environment for people and wildlife.

**Procedure**

Ask the students to think of some ways in which they could improve areas of the school grounds as a home for wildlife. They might generate a list of activities for their school.

**CLASSROOM/OUTDOORS**

**Grades: 2 – 9**

*Objective*

*Students will be able to:*

*-identify a problem involving wildlife on their own school grounds;*

*-suggest and evaluate alternative means by which to either solve the problem or at least improve the situation;*

*-undertake successfully the project; and*

*-analyze and describe the process by which they successfully solved the problem or improved the situation.*

*Materials*

*Writing materials*

*Time: Three 45-minute periods*

*Subjects: social studies, language arts, science*

*Skills: analysis, description, discussion, evaluation, invention, listing, problem-solving*

*Group size: any*

*Vocabulary: problem authority, compromise, constructive, realistic, effective, alternatives*

**ACTIVITY**

## SHRINKING HABITAT

### *Background*

All around us and all over the planet, wildlife habitat is being lost. Whenever an area of land is paved for a shopping center, divided and excavated for homes for people, and sometimes when it is plowed to grow a crop--small animals lose their homes and frequently their sources of food and water. As these smaller animals disappear, so too do the larger animals that previously depended upon the smaller animals in the food chain as a source of food. Animals that cannot tolerate human intervention may also disappear without any direct relationship to the food chain.

Students can observe this phenomenon near their homes and schools or at least in their region. This process is happening in large and small ecosystems all over the earth.

For example, many wetlands on the planet have been filled in and drained to make land for farming and homes. When they are filled in, many kinds of water birds, reptiles, amphibians, crustaceans and other life forms--including a wide variety of vegetation—are lost. Sometimes the animal forms can move on; most often they cannot.

Some of the tropical forests of the planet have become extremely vulnerable in recent years. Scientists estimate that huge numbers of plant and animal forms exist in these forests that have not even been identified as yet. They are tremendously important sources of the earth's biological diversity. In fact, some scientists warn that as these genetic pools are reduced, the flexibility, and thus the capacity to survive, of the remaining plants and animals on earth will ultimately be reduced.

### CLASSROOM/OUTDOORS

#### **Grades: 4-9**

#### ***Objective***

*Student will be able to:*  
*describe some effects of human development of land areas on plants and animals previously living in the area; evaluate the importance of suitable habitat for wildlife; recognize that loss of habitat is generally considered to be the most critical problem facing wildlife today.*

#### ***Materials***

*Three desks, chairs, string or hula hoops.*

*Three pieces of green construction paper.*

*Two pieces of blue construction paper.*

*Time: One 40-minute period*

*Subjects: social studies, science*

*Skills: application, compare/contrast, description, discussion, evaluation, generalization, kinesthetic development, observation, synthesis*

*Group Size: 6 - 30*

*Vocabulary: habitat, food chain, development*

# **APPLICATIONS/ ADAPTATIONS/ EXTENSIONS**

**TEACHER  
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PAGE**

## **APPLICATIONS/ ADAPTATIONS/EXTENSIONS**

### ***Math***

- ◆ Graphing results of simple bird census taken at school or a student's home feeders;
- ◆ Weighing food, figuring cost per pound, cost per type. Estimating the length of a flight path.

### ***Geography***

- ◆ Mapping of migration paths; summer and winter ranges.

### ***Art***

- ◆ Making drawings, paintings or sculptures of local species.

### ***Language Arts***

- ◆ Writing stories, poems, creating pop-up books with bird themes, etc.

### ***Science***

- ◆ Discussions about ecological topics based on the information gathered through observations, research and/or lessons.

### ***Computer***

- ◆ Using the Internet, encyclopedias, bird web sites and Peterson's CD that is included in the Bird Box.

### ***Music***

- ◆ Rhythm, pattern or sounds.

**ACTIVITY**

## ANIMAL POETRY

### *Background*

Poetry is an art form that is accessible to every student in some way. A poem is an organized way of expressing insight through language. Meter and rhyme combine as one kind of poetry. Song and free verse are other forms of poetry. The major purpose of this activity is for students to experience wildlife as the inspiration for a poem and to successfully write a poem!

### *Method*

Students go outside to imagine themselves as birds and then write poems.

### *Procedure*

1. Everyone can be a poet, at least to some extent, and yet many people think any kind of poetic expression is beyond their capacities. This activity is designed for every student - or any group of students - to create a poem.
2. Go outside. Find a pleasant setting on the school grounds or other natural environment. Ask everyone to pick a bird to think about. Ask everyone to close their eyes for a few minutes and imagine they are the bird living in its natural environment. With their eyes closed, you can guide their imagining process with a few words or simply leave this process to the students on their own.
3. Give everyone five minutes to go find a spot to "become" that animal. Imagine how long it lives, where it travels, how other plants and animals look from its perspective. When the students return, ask everyone to write a short poem about their bird. Poems can be free verse or rhyming. Cinquain and haiku are interesting forms. Or do a group poem. Everyone thinks of one bird. Each person contributes one word. One or more students or the instructor can put all the words together to form the poem while the others discuss their experiences in "becoming" an animal.

### **CLASSROOM/OUTDOORS**

**Grades: 4 - 12**

### *Objective*

*Each student or group of students will be able to recognize and experience the inspirational value of wildlife.*

### *Materials*

*Writing materials*

*Time: 40-minutes*

*Subjects: Language arts, science*

*Skills: description, invention, synthesis, visualization, writing*

*Group size: any*

*Vocabulary: poetry, imagination*

**TEACHER  
RESOURCE  
PAGE**

## HAIKU, CINQUAIN, DIAMANTE POETRY FORMS

### HAIKU

Haiku, originated by the Japanese, consists of three lines of five, seven and five syllables each. The emphasis is syllabic, not rhyming. For example:

The hawk soared over  
Spirit bird in my living  
Guide to harmony.

### CINQUAIN

Cinquain ("cin-kain") is a five-line form that uses a syllable count of two-four-six-eight-two. A "cinquain" (from cinq the French word for five) usually follows this organization:

- Line 1: a one-word line, a noun, that gives the poem its title
- Line 2: two adjectives that describes what the poem is about
- Line 3: three action -ing verbs that describe something the subject of the poem does
- Line 4: a phrase that indicates a feeling related to the subject of the poem
- Line 5: a one-word line, noun, that sums about the poem is about, essentially re-naming it

Panther  
Vital, quiet  
Moving swiftly to live  
Endangered by human patterns  
Near lost

Sea Otter  
Mammal of living waters  
Swimming, sleeping, eating, diving, basking, playing  
Sensitive indicator of the quality of continuing life  
Still here

*Poetry Forms (Cont.)*

**DIAMANTE**

Diamante is a poem shaped in the form of a diamond. It can be used to show that words are related through shades of meaning from one extreme to an opposite extreme, following a pattern of parts of speech like this:

noun  
adjective adjective  
participle participle participle  
noun noun noun noun  
adjective adjective  
noun

For example:

Egg  
Light light  
Living stretching growing  
Bird beak wing flight  
Feathered fluid  
raven

# **ESSENTIAL ACADEMIC LEARNING REQUIREMENTS**

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## EALR CONNECTIONS WITH THE BIRD DISCOVERY BOX

### SCIENCE

#### 1. The student understands the use of scientific concepts and principles.

To meet this standard, the student will:

1.1.5 *Use properties to identify, describe, and categorize substances, materials, and objects, and use characteristics to categorize living things.*

##### ***Basis of biological diversity***

Categorize plants and animals into groups according to how they accomplish life processes and by similarities and differences in external and internal structures. Benchmark 2

- Identify and categorize birds by their songs.  
Calling All Birds, p 61
- Identify and categorize birds by their markings and features.  
How to Learn to ID Birds, p .47
- Identify and categorize birds by their bone structure, feathers, beaks and feet  
Beaks & Feet Challenge, p. 37
- Recognize various species of birds in flight by their silhouettes.  
Bird Shapes, p. 35

1.2 *Recognize the components, structure, and organization of systems and the inter-connections within and among them.*

##### 1.2.8 ***Structure and organization of living systems***

Know that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions.

- Bird physiology transparencies in slash pocket. Benchmark 2

##### 1.2.9 ***Molecular basis of heredity***

Describe the life cycles of plants and animals, and recognize the differences between inherited and acquired characteristics. Benchmark 1

- ◆ Adaptations and Advantages p. 17
- ◆ Why Birds Sing, p. 59

*(Continued on page 42)*

(Continued from page 41)

1.3 *Understand how interactions within and among systems cause change in matter and energy.*

**1.3.7 *Life processes and the flow of matter and energy***

Recognize that living things need constant energy supplied from food or light and that, in ecosystems, substances such as air, water, nutrients, and the chemicals in food are continually recycled. Benchmark 1

- Providing Bird Habitat p. 71
- Seed dispersal, pollination

**1.3.8 *Biological evolution***

Describe how biological evolution accounts for species diversity, adaptation, natural selection, extinction, and change in organisms over time. Benchmark 2

- Adaptations pgs. 13, 14, 15, 17

**1.3.9 *Interdependence of life***

Describe how an organism's behavior and ability to survive is influenced by its environment, and other life forms, and availability of food and/or other resources. Benchmark I

- Environmental Barometer, p. 77

**1.3.10 *Environmental and resource issues***

Know humans and other living things depend on the natural environment, and can cause changes in their environment that affect their ability to survive. Benchmark 1.

- Shrinking Habitat, p. 81

**2. The student knows and applies the skills and processes of science and technology.**

To meet this standard, the student will:

*2.1 Develop abilities necessary to do scientific inquiry*

***Questioning -Benchmark 1***

Ask questions about objects, organisms and events in the environment.

- Ask questions about the behavior and unique characteristics of bird species common to the Pacific Northwest.  
Neighborly Birds, p. 55  
Bird Behavior Experiences, p. 75  
Classroom Feeder Watch (Insert after page 56)

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### ***Designing and conducting investigation -Benchmark 1***

Plan and conduct simple investigations, using appropriate tools, measures and safety rules.

- Use binoculars and bird guides to observe the behavior and identifying markings of birds.  
Let's Go Birding, p. 50

### ***Communication***

Record and report observations, explanations, and conclusions using oral, written, and mathematical expression.

- Use data collected on the types of birds in an area in order to group them by their preferred habitat: open water, wetlands, fields and woodlands.  
Let's Go Birding, p 50
- Report on conclusions of other experiences.  
Neighborly Birds, p 55  
Bird Behavior Experiences, p. 75  
Classroom Feeder Watch (Insert after page 56)

3.2 *Know that science and technology are human endeavors, interrelated to each other, to society, and to the workplace.*

- ◆ Use of binoculars, microscope, books, and the computer to complete activities in BDB guide.

## **GEOGRAPHY**

### **3. The student observes and analyzes the interaction between people, the environment, and culture.**

To meet this standard, the student will:

3.1 *Identify and examine people's interaction with and impact on the environment.*

Analyze the different ways people use the environment, the consequences of use and possible alternatives. Benchmark 2

- Environmental Barometer, p. 77

3.2 *Analyze how the environment and environmental changes affect people.*

Describe how differing environments provide varying opportunities and limits for human activity .Benchmark I

- Can Do! p: 79

- Shrinking habitat, p. 81

(Continued on page 44)

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## **MATH**

### **1. The student understands and applies the concepts and procedures of mathematics.**

To meet this standard, the student will:

#### *1.1 Estimation*

Use estimation to predict computation results and to determine the reasonableness of answers. Benchmark I

- Use in Neighborly Birds activity. P. 55
- Use in Bird Behavior Experiences, p. 75

### **4. The student communicates knowledge and understanding in both everyday and mathematical language.**

#### *4.2 Organize and interpret information*

Organize and clarify mathematical information in at least one way - reflecting, verbalizing, discussing, or writing. Benchmarks 1 & 2

- Let's Go Birding, (recording numbers of species) p. 50
- Bird Behavior Experiences, p. 75 #2
- Environmental Barometer, p. 77 4.3

#### *4.3 Represent and share information*

Express ideas using mathematical language and notation such as physical or pictorial models, tables, charts, graphs, or symbols..

- Bird Beak Game, p. 39
- Classroom Feeder Watch-Exploration #8, p 5 of insert
- Bird Behavior Experiences, p. 75
- Environmental Barometer, p. 77

## **READING**

### **3. The student reads different materials for a variety of purposes.**

To meet this standard, the student will:

#### *3.1 Read to learn new information.*

Observe and use signs, labels, and instructions; locate and use a variety of resource materials; select resources to answer a question or solve a problem.

- Reading bird guides
- Reading resource and story books: magazine articles, etc.
- Looking up information on internet.

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## **WRITING**

### **2. The student writes in a variety of forms for different audiences and purposes.**

#### ***2.2 Write for different purposes***

Including: to respond to teacher's prompt, to tell about something, to name something, to describe something, to direct, to imagine, to learn, to question, to inform others, to persuade others.. Benchmarks 1 & 2

- Writing a bird report
- Creating a poem or story
- Writing up experiments/explorations
- Keeping a journal of sitings

# PUBLICATIONS

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## BIRD PUBLICATIONS

### *Books*

BIRD -An Eyewitness Book, David Burnie. 1988. Alfred A. Knopf, Inc., New York, NY. ISBN 0-394-89619-X. 63 pp. Ages: all.

Bird Watch -A Book of Poetry. Jane Yolen; ill. By Ted Lewin. 1990. Philomel Books, New York

Bird Watching for Kids, Stenen A. & Elizabeth May Griffin. 1995 Northwood Press, Inc., Minocqua, WA. ISBN 1055971-457-3. A "how to" book on birdwatching. Ages 7-14

Birdwise: For Fun Teats for Finding Out About Our Feathered Friends, by Pamela M. Hickman

Crinkleroot's Guide to Knowing the Birds, Jom Armosky. 1992. Bradbury Press, Macmillan Publishing Co., New York, NY. ISBN 0-02-705857-3. 32 pp. \$15. Ages 6- 12

Exploring the World of Birds, Adrian Forsyth and Laurel Aziz. 1990. Camden House Publishing, Ontario, Canada. ISBN 0-92-656-94-3. 72 pp. \$9.95. Ages 10-adult.

Feathers for Lunch. Lois Ehlert; ill. By Lois Ehlert. 1990. Harcourt Brace & Co., San Diego, CA. ISBN 0-15-230550-5. 32 pp. \$13.95.

Garden Bird Facts, by Marcus Schneck. Full-size paperback with tons of well laid out facts, photos, illustrations, covering birds right from their dinosaur beginnings.

Outside and Inside Birds, by Sandra Markle. 1994. Bradbury Press, Macmillan Inc., New York, NY. ISBN 0-02- 76312-2. 40 pp. \$15.95.

Owls, by Jane Yolen

Sharing the Wonder of Birds with Kids, by Laura Erickson. Includes her classroom activities and experiences with kids *in* the field.

She's Wearing a Dead Bird on Her Head!, By Katheryn Laskyi ill. By David Catrow. 1997. Hyperion Paperbacks, New York, NY. ISBN 0- 7868-1164-1. 33 pp. \$5.95. Ages 5-9

(Continued on page 48)

*(Continued from page 47)*

Usborne Science and Nature Ornithology, edited by Corinne Stockley; ill. By Chris Schields, Maurice Pledger and Kevin Lyles. 1992. EDC Publishing, Tulsa, OK. ISBN 0-7460-0685-3. 44 pp. \$7.95. Ages 8-16.

What is a Bird? By Robert Snedden; ill. By Oxford Scientific Films. 1992. Sierra Club Books, San Francisco, CA. ISBN 0-8756-539-0. 32 pp. \$13.95, \$17.95. Ages 8-16.

### ***Packets***

Birds in Your Backyard. Cornell Cooperative Extension Service; 1998. A packet of descriptive materials on birds in your backyard, including making bird houses and feeders. Ages: grades 6-12. Order from: Cooperative Extension Service, Cornell University, 104 Fernow Hall, Ithaca, NY 14853. Phone 607-2555-2824.

### Free Teacher Packages

Call the Audubon Society, American Birding Association, Cornell Lab of Ornithology, and Canadian Nature Federation.

Don't forget to look for bird books in used bookstores. There are some great buys to find. Many bird books can be ordered from Amazon Books at: <http://www.amazon.com>

### ***Magazines on Wild Birds***

Audubon Magazine. monthly membership or news stand or via internet: <http://magazine.audubon.org/> Use membership code: Y13 7XCH to become affiliated with Vancouver Audubon and their resources.

Birding -the American Birding Association -quarterly, with membership or via the internet: <http://americanbirding.org/bdggen.htm>

Bird Watchers Digest -bimonthly, news stand, or via the internet: <http://www.petersononline.com/birds/bwd/index.html>

Living Bird Magazine -quarterly, with membership, or write to: Cornell Laboratory of Ornithology, 159 Sapsucker Woods Road, Ithaca, New York, NY 14850. Or via the internet: <http://www.ornithology.cornell.edu/LivingBird/TOCLBSu97.htm>

Wildbird Magazine -monthly, newsstand, or write: Subscription Dept. P.O. Box 52898, Boulder, CO 80323-2898

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## WEB SITE ADDRESSES AND HYPERLINKS

Eastside Audubon .....	<a href="http://eastsideaudubon.org">eastsideaudubon.org</a>
National Audubon Society .....	<a href="http://www.audubon.org">www.audubon.org</a>
National Audubon Society of Washington State And British Columbia .....	<a href="http://wa.audubon.org">http://wa.audubon.org</a>
Starting Point to Web Site Birding .....	<a href="http://www.birder.com">www.birder.com</a>
The Bird Guide .....	<a href="http://thebirdguide.com">http://thebirdguide.com</a>
Tweeters .....	<a href="http://www.scn.org/earth/tweeters">www.scn.org/earth/tweeters</a>
Washington Ornithological Society .....	<a href="http://www.wos.org">www.wos.org</a>
Oregon Birders Online .....	<a href="http://birdingonthe.net/maillinglists/OBOL.html">http://birdingonthe.net/maillinglists/OBOL.html</a>
Roger Tory Peterson Institute .....	<a href="http://www.rtpi.orr">www.rtpi.orr</a>
Hummingbirds .....	<a href="http://www.hummingbirds.net/">www.hummingbirds.net/</a>
Hummingbird Society .....	<a href="http://www.hummingbirdsociety.org">www.hummingbirdsociety.org</a>
The Nature Conservancy .....	<a href="http://nature.org">http://nature.org</a>
National Wildlife Refuges .....	<a href="http://refuges.fws.gov">http://refuges.fws.gov</a>
Ornithology Info .....	<a href="http://www.nmnh.si.edu/BIRDNET/">www.nmnh.si.edu/BIRDNET/</a>
Birdsource (Cornell Laboratory & NAS) Backyard Bird Watch, etc. ....	<a href="http://www.birdsource.org">www.birdsource.org</a>
The Virtual Birder .....	<a href="http://www.virtualbirder.com/vbirder/">www.virtualbirder.com/vbirder/</a>
Children's Guide to Birdwatching.....	<a href="http://www.tpwd.state.tx.us/adv/birding/beingbird/kidbird.htm">www.tpwd.state.tx.us/adv/birding/beingbird/kidbird.htm</a>
American Birding Association .....	<a href="http://www.americanbirding.org/">www.americanbirding.org/</a>
Wild Birds Unlimited (WBU) .....	<a href="http://www.wbu.com">www.wbu.com</a>
Wild Birds Unlimited Feeder Cam.....	<a href="http://www.wbu.com/feeder_cam_home.htm">www.wbu.com/feeder_cam_home.htm</a>
Wild Birds Unlimited Educational Resources.....	<a href="http://www.wbu.com/edu">www.wbu.com/edu</a>
Cornell Lab of Ornithology .....	<a href="http://birds.cornell.edu">http://birds.cornell.edu</a>

U.S. Fish & Wildlife Service .....	<a href="http://fws.gov/">http://fws.gov/</a>
Nature Canadian .....	<a href="http://www.cnf.ca">www.cnf.ca</a>
Western Birder and Naturalist .....	<a href="http://www.westernbirder.com/">www.westernbirder.com/</a>
Oriental Bird Club.....	<a href="http://www.orientalbirdclub.org">www.orientalbirdclub.org</a>
Electronic Resources on Ornithology	<a href="http://www.chebucto.ns.ca/Environment/NHR/bird.html">www.chebucto.ns.ca/Environment/NHR/bird.html</a>
Neotropical Bird Club .....	<a href="http://www.neotropicalbirdclub.org/">www.neotropicalbirdclub.org/</a>
BIRDNET .....	<a href="http://www.nmnh.si.edu">www.nmnh.si.edu</a>
Birdzilla .....	<a href="http://www.birdzilla.com">www.birdzilla.com</a>
My Birding .....	<a href="http://www.mybirding.com">www.mybirding.com</a>
National Wildlife Federation .....	<a href="http://www.enature.com">www.enature.com</a>
Educator's Reference desk.....	<a href="http://www.eduref.org">www.eduref.org</a>

## FREE E-MAIL LISTSERVES

BIRDCHAT to post messages .....	<a href="mailto:birdchat@listserv.arizona.edu">birdchat@listserv.arizona.edu</a>
BIRDCHAT to subscribe .....	<a href="mailto:listserv@listserv.arizona.edu">listserv@listserv.arizona.edu</a>
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BIRDHAWK .....	<a href="http://listserv.arizona.edu/archives/birdhawk.html">archiveshttp://listserv.arizona.edu/archives/birdhawk.html</a>

# SCHOOL YARD ENHANCEMENTS

SCHOOL YARD  
ENHANCEMENTS

## MILK CARTON FEEDER

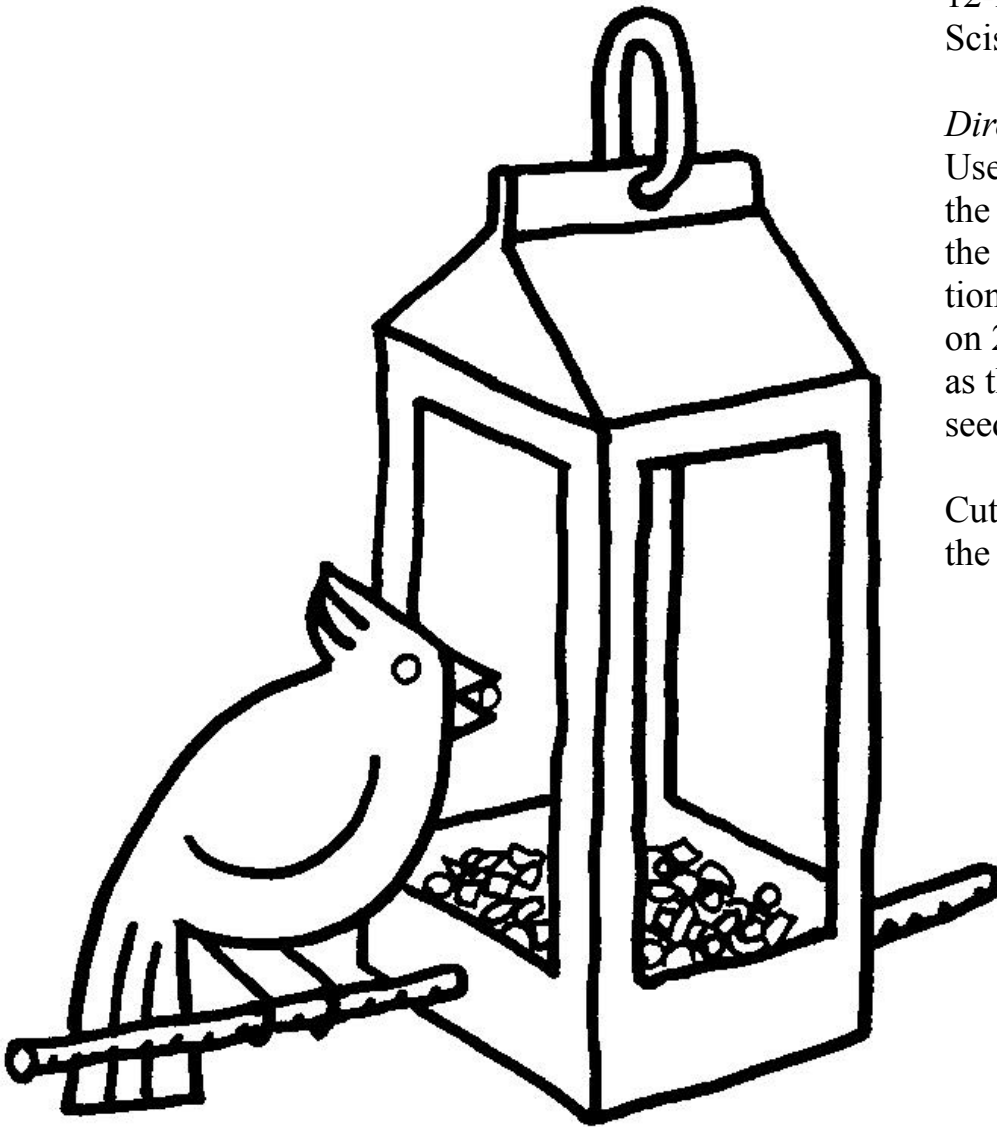
### *Materials*

Clean milk carton  
2 feet of heavy string  
12-inch long stick or dowel  
Scissors

### *Directions*

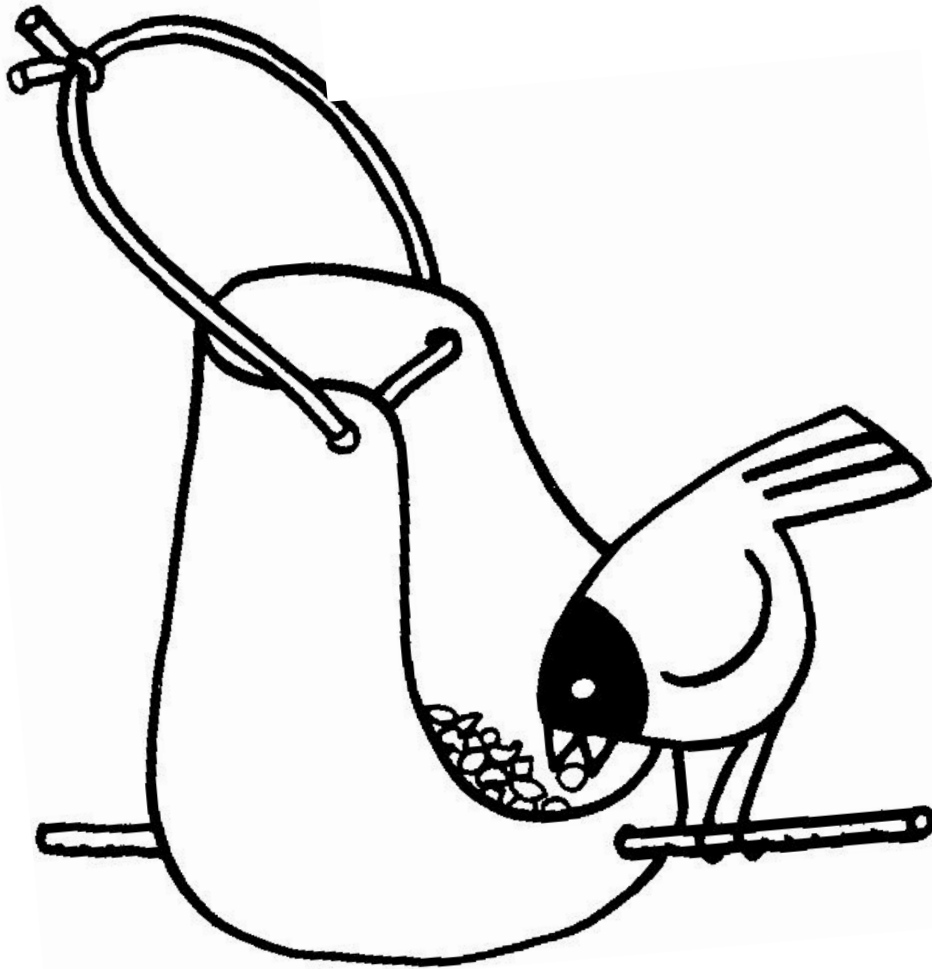
Use the scissors to cut away the carton as shown. Insert the stick in the bottom portion, letting it make a perch on 2 sides for birds to sit on as they dig through the seeds.

Cut or punch a hole to insert the string for hanging.



**SCHOOL YARD  
ENHANCEMENTS**

## JUG BIRD FEEDER



### *Materials*

Gallon plastic jug  
12-inch long wire, string or  
leather strap  
12-inch long stick or dowel  
Scissors

### *Directions*

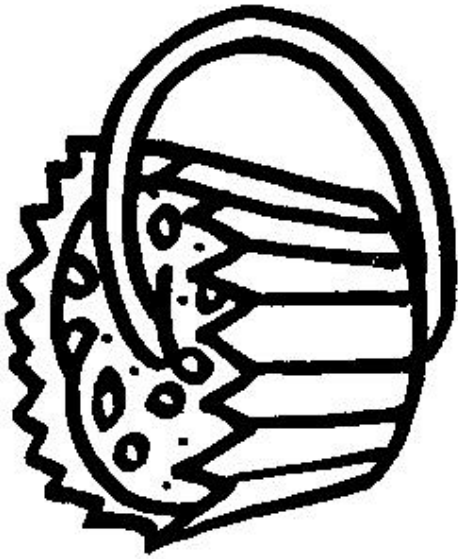
Cut away the sides and top  
of the jug, leaving a base of  
about 1½”.

Poke 2 holes in the plastic  
with a nail, using scissors or  
a knife to enlarge the hole if  
needed. Push the stick  
through the holes, so it pokes  
out both sides to give the  
birds a perch.

Poke 2 holes through the top  
and insert the string or wire  
for hanging.

SCHOOL YARD  
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## BIRD CUPCAKES



### *Materials*

- \* ½ cup peanut butter\*
- 1 cup birdseed
- 2 ½ cups cornmeal
- ½ cup melted shortening
- Greased muffin tin
- Pencil-sized sticks
- Yarn

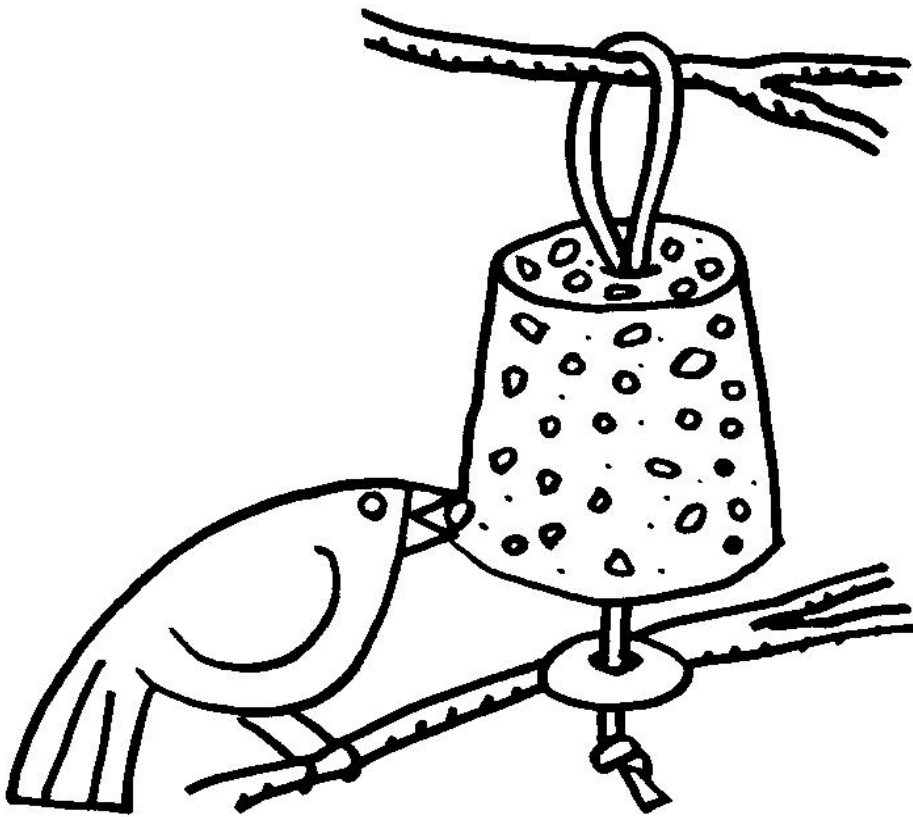
### *Directions*

Combine the ingredients in a large bowl. Stir together. Drop the mixture into the muffin cups, pressing it down with your fingers. To create a hole for hanging, push a stick down in the middle. Let dry. Remove from the pan and take out the sticks. Thread yarn through the hole. Tie a loop and hang from a tree for the birds to enjoy.

- \* Because many children have nut allergies, you can substitute alternatives such as: soy nut butter, amaranth butter and sunflower butter.
- \* Please do not contaminate the bird box with nut residue.

**SCHOOL YARD  
ENHANCEMENTS**

## BIRD BELL



### *Materials*

Small yogurt container or paper cup  
Ingredients listed in Bird Cupcakes  
Yarn  
Cardboard circle, about 2 inches in diameter (A cereal box would be good for this).  
Nail or sharp pencil

### *Directions*

Prepare the ingredients as described in Bird Cupcake. Punch a hole in the bottom of the yogurt container. Punch a hole in the center of the cardboard circle. Thread the yarn through the circle and knot the end. You may want to tie on a piece of twig to keep the yarn from pulling through the hole. Thread the other end of the yarn through the hole in the bottom of the cup. Press the bird seed mixture into the cup and around the yarn, so the yarn will go right through the center of the birdseed. Pull the yarn up tight so the cardboard circle fits against the birdseed mixture. Let it harden. Tie a loop at the end of the yarn for hanging. Peel the cup away, and the bird seed will be shaped like a bell—ready to hang from a tree so the flock can feast!

**SCHOOL YARD  
ENHANCEMENTS**

## **PINE CONE FEEDER AND TISSUE TUBE FEEDER**

### *Materials*

Pine cone or tissue tube  
Corrugated cardboard  
Table knife or popsicle stick  
Peanut butter or vegetable shortening  
Birdseed  
12 inches of string or yarn

### *Directions*

If using a tissue tube, poke 2 holes through one end (opposite each other). Thread the string or yarn through the holes and knot for hanging.

Use the knife or stick to spread peanut butter or shortening all over the pine cone or tube. Be sure to spread between the scales of the cone.

Place a layer of birdseed in the pan and roll the cone or tube in the seed, until all the peanut butter or shortening is covered with birdseed. Tie the string around one end of the cone or tube and hang it from a tree branch.