



# Birds, Beaks & Adaptations

## In a Nutshell



Students will investigate bird adaptations first-hand by rotating through a series of feeding stations. Using a tool that simulates one style of bird beak, they will learn how adaptations connect birds to certain habitats and behaviors. Students will then take binoculars on a hike to observe other bird adaptations.

Grade 2-6  
Season Fall, Winter, Spring  
Location Visitor Center

### Literature Connections

Beaks By Sneed B. Collard III (IG970L)

Bird by David Andrew Burnie (620L)

What Do You Do with a Tail Like This? by Robin Page

Fine Feathered Friends: All about Birds by Tish Rabe

She's Wearing a Dead Bird on Her Head! by Kathryn Lasky & David Catrow (AD870L)

Unbeatable Beaks by Stephen R. Swinburne (AD770L)

### Pre-Activities

*Flying WILD activity, Jeop-Birdy*

Students learn interesting bird facts while testing their knowledge about bird biology, adaptations, and behaviors.

Minnesota Valley National Wildlife Refuge

3815 American Blvd. East  
Bloomington, MN 55425



15865 Carver Highlands Drive  
Carver, MN 55315

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### On-site Activities

Using different tools, students will learn about different bird beak styles and describe how these beaks are adapted to feed on different types of food found in different habitats. Students will then utilize binoculars and a bird checklist to locate, observe, and identify birds while hiking on the refuge.

### Classroom Connection

*Project WILD activity, Adaptation Artistry (5-8)*

Students will identify and describe the advantages and evaluate the importance of bird adaptations. \* *This activity is easily adapted for younger students.*

*Project WILD activity, Seeing is Believing (K-4)*

Students will identify vision as one example of an adaptation and describe the importance of vision adaptations to animals.

### Teacher Resources

Peterson Field Guide to Eastern & Central American Birds by Roger Peterson  
One Thousand Facts on Birds by Jinny Johnson

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## Birds, Beaks and Adaptations Pre-visit Activities

### Materials

- Jeop-Birdy board (optional)
- Jeop-Birdy question & answer sheets (for leader)
- 2 Bird calls
- White board
- Dry-erase markers or Post-it notes
- Eraser

### Introduction

Welcome students to the game of Jeop-Birdy! This game tests their knowledge about birds and bird adaptations!

### Jeop-Birdy

To begin, use either the Refuge's Wildlife Jeopardy board or a dry-erase board. Stick or write the categories at the top, with the point value listed beneath each category. Remove/erase each number as the question is chosen. Example for set up:

Bye-Bye Birdie	Bird Words	Amazing Adaptations	Bird Brained	Save the Birds
100	100	100	100	100
200	200	200	200	200
300	300	300	300	300
400	400	400	400	400
500	500	500	500	500

Divide students into two teams. Ask each team to choose a team name (preferably a MN bird name), and a team captain who will speak/answer for the team. It is recommended that an adult keep tally of the points for each team.

Flip a coin to determine the team that will answer first. Explain to students the value of points selected will determine the difficulty of the question (higher points mean greater difficulty). With assistance from his/her teammates, the captain from the first team must choose a category and point value. As a group, the team should

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decide the answer together. After everyone has agreed, the ONLY team member that may answer the question is the team captain. If the team is correct, they will receive the points. If the first team answers the question incorrectly, there is no penalty (no point loss); however, the second team will be given the opportunity to answer the same question. The second team may discuss the question as a group, but ONLY the team captain may answer after everyone in the group has agreed. If the second team answers incorrectly, the question must be dropped and the Jeopardy leader should share the correct answer with the students. Continue the game with the second team selecting the next question.

The game will end when either all the point values have been chosen under each category, or time is up. Remember to leave 5 minutes at the end for a wrap-up discussion.

### Wrap-Up

Ask students, after playing this game, what new facts they learned about bird behaviors and adaptations. When students visit the refuge during the field trip, they will have an opportunity to observe some of these bird behaviors and adaptations using binoculars.

Please remind students during the field trip they will be outside and should wear outdoor clothes appropriate for the season.

## Jeop-Birdy Questions

	Bye-Bye Birdie	Bird Words	Amazing Adaptations	Bird Brained	Save the Birds
100	This is a word used to describe birds when they can no longer be found on earth.	This is another word for the mouth of a bird.	This feature found on a bird helps them fly, and is not shared with any other living animal.	This is the smallest bird in the world.	When you are hiking and come upon a bird's nest, this is something you should not do.
200	This bird is the United States symbol, and was almost driven to extinction by a pesticide called DDT.	The claws found on a bird of prey.	Baby birds develop in these.	The seasonal movement of birds from one place to another.	Birds often fly into these "invisible" structures, found everywhere from skyscrapers to your house.
300	This is an obstacle that can obstruct a bird's flight pattern.	The natural process of replacing old feathers with new ones.	Most owls use this to find food.	Male birds are brightly colored for this reason.	These are domestic predators (household pets) that kill hundreds of thousands of birds each year.
400	This is one of the major causes of extinction in the world.	Bird feathers and beaks are made out of this material.	The type of feather that keep birds warm during the winter.	One of the fastest birds in the world.	These are chemicals that have led to declines in the population of many bird species.
500	Only 100 years ago, flocks of 1,000's of these birds were common. Over-hunting drove them to extinction.	This is the name of a colony of herons.	What makes a bird skeleton different from other animal skeletons?	What is the one sense that vultures rely on that is not well developed in other birds?	The Act (Federal law) created by the U.S. Fish & Wildlife Service to protect birds and other wildlife populations.

## Jeop-Birdy Answer Sheet

	Bye-Bye Birdie	Bird Words	Amazing Adaptations	Bird Brained	Save the Birds
100	What is extinct?	What is the bill/beak?	What are feathers?	What is a hummingbird?	What is collecting, touching, or disturbing birds or the nests?
200	What is the Bald Eagle?	What are talons?	What are eggs?	What is migration?	What are windows?
300	What is - a radio/cell phone tower, an antenna, a building, an electrical wire, or a windmill.	What is molting?	What is sound or listening?	What is to attract a mate and/or protect its young?	What are cats?
400	What is habitat loss?	What is keratin?	What are downy feathers?	What is the Peregrine Falcon?	What are pesticides?
500	What is the Passenger Pigeon?	What is a rookery?	Hollow bones	Sense of smell	What is the Endangered Species Act?

## Birds, Beaks and Adaptations On-site Activities

### Materials

- 2 containers of water:
  - 1 – shallow (2” of water)
  - 1 – deep (10” or more of water)
- 1 pie pan
- 4+ tweezers
- 4+ tongs
- 4+ long handled salad tongs
- 4+ pliers
- 1 package rice
- 1 package popcorn (or other sinking objects)
- 1 package sunflower seeds
- 1 stump with holes in it (to hold rice)
- Floating objects (cut up ½ inch long straws work well)
- Cups to use as a “stomach” to put eaten food in
- Habitat Record Sheet
- Pictures of birds (example beaks & most commonly seen)
- Peterson First Field Guide to Eastern Birds- one per adult
- Clipboards
- Pencils
- Bird Observation data sheet
- Binoculars- one per student
- Snowshoes (*must have at least 6” of snow*)

### Introduction

Inside Visitor Center (20 minutes)

Explain to the students that first they will rotate through a series of learning stations to discover how a bird’s food preference is based on its beak shape. Then they will participate in a hike on the refuge to observe birds and their behaviors using binoculars.

### Birds Beak Activity

A bird’s beak is a unique and multi-functional tool. It can help a bird gather or capture food, communicate, groom feathers, defend territories, and attack rivals. The shape of a bird’s beak is a clue to its main source of food. The shape of a bird’s beak is designed for eating particular types of food such as: seeds, fruit, insects, nectar, fish, or small mammals.

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Bird beaks have adapted over time to help birds find food within their habitat which allows them to survive. The following are examples of bird beaks that may have evolved over a long period of time and demonstrate a particular adaptation:

- **Cardinal and grosbeak** – have short, thick, cone-shaped beaks for crunching and cracking seeds.
- **Woodpeckers** – have thin, chisel-type beaks to search out insects in trees.
- **Loons, herons, terns, and bitterns** – have straight, pointed bills to help spear prey such as fish.
- **Hummingbirds** – have straw-like beak used to suck up nectar from flowers.
- **Raptors** – have hook-like beaks used to tear apart small prey such as mice.

Explain to students for this activity the class will “become” different types of birds. Show them the different “beaks” (tools) they will use: long and short handled tongs, tweezers, and pliers. Explain to the students their job is to find the proper habitat suited for each bird. Mention that the tools or “beaks” provide a clue to what a bird may eat and where it may live.

Show students four simulated habitats (marsh, pond, prairie, forest). As you show each habitat, give a short description of the habitat to create an image.

Divide students into groups of four. Each student or group should receive a different tool (i.e. one group receives pliers, one group receives tweezers, etc.) and a

“stomach” (cup). Each group, or student, must keep the same tool throughout the entire activity. Line each team up at a station and explain how they will move from one habitat station to the next. Groups should be given 30 seconds at each habitat to “eat” as many food items as possible. Each student must keep one hand behind their back and must not let their hand get wet. After 30 seconds, tell students to “rotate”. Students must stop “eating” and move to the next “habitat.” When students arrive at their new station, tell them to “eat”, allow 30 seconds of eating time in the new habitat.

The group that begins at the far left habitat must go to the end of the line after you say “rotate.” Rotations will continue until all groups have had a chance at trying to “eat” at all the habitats.

### Simulated Habitats

Marsh = container with shallow water and floating objects

Pond = container with deep water and popcorn at the bottom

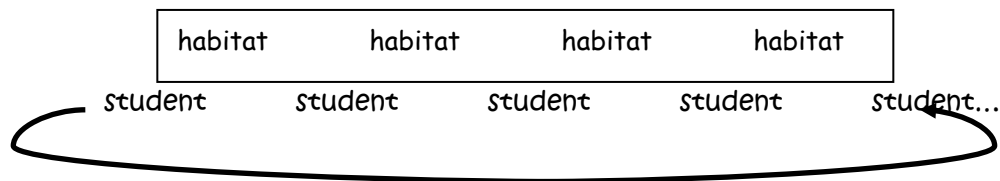
Forest = stump with holes and rice in the holes

Prairie = sunflower seeds in pie pan



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Rotation pattern:



For food to qualify as “eaten”:

**Marsh** = floating objects must be dropped into the “stomach” and hands must not touch the water

**Pond** = popcorn must be dropped into “stomach” and hands must not touch the water

**Forest** = rice must be picked off the bark/stump (not from the table), then dropped into the “stomach”

**Prairie** = sunflower seeds must be cracked and the nut dropped into stomach

Emphasize to students **this is not a competition**; they are trying to find the habitat best suited to their beak. At the end of each rotation, either record the number of food pieces eaten at each station for each style beak on the dry erase board or on the students’ Habitat Record Sheets.

Using a bar graph or pie chart, ask students to figure out the top habitat choice for their “beak.” For younger students, use their total food numbers and make a graph/chart as a class.

### Bird Hike

On refuge, (60 minutes)

Using photographs, discuss common bird species students might see during their hike. Explain to students how to use the observation data sheet to record their findings during their hike on the refuge.

Divide the class into groups, assuring at least one adult accompanies each group. Designate different areas, or territories, for each group to observe birds and record their observations. To best compare and contrast species and their behaviors, assign at least one group to each habitat type.

## Wrap-up Management Connection

Inside Visitor Center (10 minutes.)

### Monitoring Birds

Lead the group through a discussion of the types of birds and bird behaviors they observed. Then discuss the information obtained and the techniques used to monitor birds

A main reason for the creation of the U.S. Fish and Wildlife Service in the early 1900's (1903) was to regulate the over hunting of birds for sport, fashion, and subsistence. By researching birds through field observation and banding, the U.S. Fish and Wildlife Service has monitored population counts, identified migration routes and food preferences for individual species, preserved high quality habitat, and more.

# Birds, Beaks and Adaptations

## Habitat Record Sheet

**Directions:** Have all students/groups record the number of food pieces eaten from each habitat with each tool.

		Habitats				
		Pond	Marsh	Forest	Prairie	Results
Beaks	Pliers					
	Short Tonggs					
	Long Tonggs					
	Tweezers					

## Bird Observation Data Sheet

Look for the behaviors listed below on the Refuge. Check the behaviors you find, list the bird's specific location (in water, on tree branch) , habitat (prairie, forest, wetland), and if possible try to identify the bird. If you cannot identify the bird record some identifying features (color, size, crest on head, etc.).

Check	Bird Behavior	Specific Location and Habitat	Identification
	Singing or calling		
	Preening (sometimes looks as if it's nibbling, tugging, or combing its feathers with its beak.)		
	Bathing in water		
	Soaring (Its wings aren't beating)		
	Flying (Its wings are beating)		
	Perched on a limb or branch		
	Hovering in mid-air (wings beating rapidly)		
	Swimming		
	Walking or hopping on the ground		
	Diving or tipping up its rump in the water		
	Standing on the ground		
	Wading in water		
	Feeding		
	Flying with food in its mouth		
	Flying with or gathering nesting materials		
	Perched on the edge of its nest		
	Climbing a trunk or branch		
	Hanging upside down from a branch		
	Chiseling into the side of a tree		
	A group of birds perching together		
	A flock of small birds flying together		
	A smaller bird chasing a larger bird		
	Other (list behavior)		
	Other (list behavior)		

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**Birds, Beaks, and Adaptations**  
**Rainy Day Hike Alternatives**

### Materials

- Birds Clever Catch Ball and question / answer card
- Clipboards (one per group)
- Pencils (one per group)
- Bird Feeder Survey data sheet (one per group)
- Easel with paper
- Markers

### Bird Feeder Survey

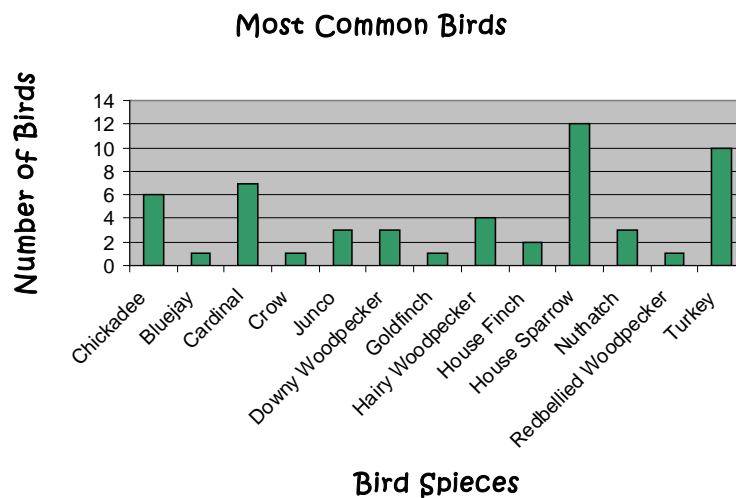
Divide the class into 2-3 groups, depending on how many feeder stations are available in the Visitor Center. Explain that each group will observe birds and bird behavior at the feeders, and then record their findings on the data sheet. Pass out a clipboard, pencil, and data sheet to each group. Allow groups at least 15 minutes to observe and record.

Bring students back to the classroom and ask them to tally the species they observed. Students should:

- count the number of different species,
- record the highest number of visits by one species of bird, and
- calculate the total number of birds observed.

Compile data from each group on the board. Work with students to organize and/or graph the findings to answer any of the following questions:

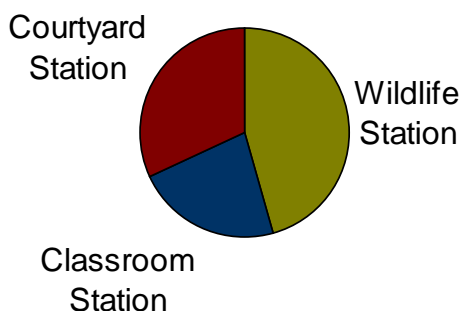
- What was the most common bird species to visit the feeder stations?



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- Which feeder station had the most number of birds? Which station had the smallest number?

### Feeder Station Visitation



- Which feeder station had the most diverse species of birds? What could be done to increase diversity of birds visiting the other stations? (offer different food choices, set up more feeders, etc.)

### Birds Clever Catch Ball

Use the same two groups from the pre-activity *Jeop-Birdy* or divide the class into two teams. Line up the teams facing each other in a large space of the visitor center or outside. Instruct the students, beginning at one end of the line, to toss the Birds Clever Catch Ball to the student directly opposite them. If the student can correctly answer the question closest to where his/her right thumb lands when they catch the ball, they collect 1 point for their team. If the student answers incorrectly, the group will not receive the points and the ball must be tossed to the next player in line on the opposite team. Keep track of each team's points. Play until all 36 questions have been answered or you run out of time. Remind students to listen carefully because questions might be repeated making it easier to gain points for their team. A questions and answers sheet is available at the refuge. Create a set of your own questions students may choose from, if you prefer not to let students repeat questions.

# Bird Feeder Data Sheet

Watch the birds at your feeding station. Record each species you are able to identify and the number of each bird species that visit the feeders.

Bird Species

Number of Visits

Bird Species	Number of Visits