

# Bird adaptations: what do birds eat and why?

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## Objective

Students will learn about general types of bird beaks and understand the differences by comparing what different birds eat and why.

### ***National Science Education Standard:***

#### **Science as Inquiry Content Standard A, K-4**

As a result of activities in grades K-4, all students should develop: (1) Abilities necessary to do scientific inquiry, (2) Understanding about scientific inquiry

#### **Life Science Content Standard C, K-4**

As a result of the activities in K-4, all students should develop an understanding of (1) The characteristics of organisms, (2) Organisms and environments

### ***Missouri Grade Level Expectations:***

#### **Strand 3: Characteristics and Interactions of Living Organisms**

Organisms have basic needs for survival (Grade 1)

#### **Strand 7: Inquiry (all grade levels)**

## Background information

The bird world contains an amazing variety of beaks. Beaks are used for eating, defending, feeding young, gathering nesting materials, building nests, preening, scratching, courting and attacking. The shape and size of each species' bill is specific for the type of food it gathers. For instance, cardinals have heavy thick bills used to crack seeds, but meat-eating birds like the eagle have a sharp, hooked bill to tear flesh. Robins have a varied diet and a bill shape that permits eating a variety of foods (worms, fruit). Humming-birds have thin bills to sip nectar. Birds use their tongues for a variety of jobs also. Not only are tongues used to drink, but also to hold, pierce and tear food.

Since birds consume great amounts of food, they have a crop (sac) which stores food until it moves to the gizzard. Small stones and grit in the gizzard grind the food. The gizzard is made of strong muscles. In the wood duck, those muscles can break down a whole acorn.

Birds have a high metabolic rate and must eat often to survive. Most birds must continually search for food. Only a few birds such as owls, crows and nuthatches store food for future use.

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### Materials

Food Symbol	Tools/Beaks	Birds
Rubber erasers to represent fish in a container (such as a bowl) with water	Needle nose pliers Eyedropper or straw Slotted spoon	Great blue heron Kingfisher
Popcorn or tiny marshmallows to represent flying insects	Envelope or fishnet Tweezers Chopstick	Swallow Whip-poor-will Flycatcher
Whole walnuts or other nuts to represent seeds with hard coverings	Nutcracker or pliers Tongs Slotted spoon	Sparrows Rose-breasted grosbeak Cardinal
Bunch of grapes hanging from a string to represent fruit hanging from a tree	Tweezers Strainer Nutcracker	Cedar waxwing Brown thrasher Robin
Large container with tiny marshmallows to represent aquatic plants/animals	Slotted spoon Tablespoon Chopsticks	Mallard duck Canadian geese
Rice scattered on/in a small log with a hole to represent insects in a hollow tree	Tweezers Straw Pliers	Woodpecker Nuthatch Brown creeper
Bread to represent a mouse or other small animal	Channel-lock pliers Tongs Tweezers	Hawk Owl Eagle
Bowl filled with dry oatmeal with gummy worms on the bottom to represent worms buried in mud	Tweezers Straw Screwdriver	Sandpiper Snipe

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## Engage

Show students pictures of birds that live in the local area. What is a habitat? What kind of habitat do each of these birds need to survive?

## Explore

Let's think about birds' eating habits. What questions can we ask about their eating habits?

### ***Procedure:***

Set up eight different stations, each with a special type of "food" that fits one of the eight beaks described. At each station you will need three different tools. Also have a sign at each station that tells what type of food is represented (Station #1, fish in shallow water; Station #2, flying insects). Identified below are a selection of tools and the one (\*) that best fits each type of food.

STATION 1: Rubber erasers in a container of water to represent fish in a shallow water area (fish-eating beak). Tools: needle-nose pliers\*, eyedropper or straw, slotted spoon Bird Examples: great blue heron, kingfisher

STATION 2: Popcorn or tiny marshmallows tossed and caught in the air to represent flying insects (insect-catching beak). Tools: envelope or fishnet\*, tweezers, chopstick Bird Examples: swallow, whip-poor-will, flycatcher

STATION 3: Whole walnuts or other nuts to represent seeds with hard coverings (seed-eating beak). Tools: nutcracker or pliers \*, tongs, slotted spoon Bird Examples: sparrows, rose-breasted grosbeak, cardinal  
STATION 4: Bunch of grapes hanging from a string to represent fruit hanging on a tree (fruit-, insect-eating beak). Tools: tweezers\*, strainer, nutcracker Bird Examples: cedar waxwing, brown thrasher, robin

STATION 5: Large container with tiny marshmallows to represent aquatic plants and animals (water and mud-sifting beak). Tools: slotted spoon\*, tablespoon, chopsticks Bird Examples: mallard, Canadian geese

STATION 6: Rice scattered on and in a small log with a hole (or rice in a container with a small opening) to represent insects in a hollow tree (chisel beak). Tool: tweezers or forceps\*, straw, pliers Bird Examples: woodpecker, nuthatch, brown creeper

STATION 7: Bread to represent a mouse or other small animal (preying beak). Tool: channel-lock pliers\*, tongs, tweezers Bird Examples: hawk, owl, eagle

STATION 8: Bowl filled with dry oatmeal with gummy worms on the bottom to represent worms buried in mud (probing beak). Tool: forceps, tweezers\*, straw, screwdriver Bird Examples: sandpiper, snipe

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Divide the group into eight teams and have them rotate around the stations. From the three tools at each station, the group decides which is most efficient for the specific food type. Encourage students to try each tool.

### **Explain**

Gather as a group and discuss the beak and tool choices. What particular features made one tool "fit" better than others? Since the straw was not used in this activity, have students name a bird whose beak would function like a straw (hummingbird as a nectar-sipper).

### **Elaborate/Extend**

What other investigations might we do to explore birds' eating habits? What other things might we explore about birds? How might we do these things?

### **Evaluate**

Review the pictures of the birds from the first part of the activity. What did each bird eat? How might changes in habitat affect these birds? Discuss loss or modification of habitat and the resulting loss of food supplies for birds. Include in the discussion the fact that different species of birds require specific food types and that they do not change their feeding habits because the preferred food is not available.

Activity adapted from <http://www.inhs.uiuc.edu/chf/pub/virtualbird/student/les4.html> and [www.nbtc.cornell.edu](http://www.nbtc.cornell.edu).