Day 2
Bird habitats, food, and foraging

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Introduction

A bird's appearance, diet, and habitat are all connected. As kids focus on bird **adaptations** and the different ways that birds actually get their food, they will explore bird **habitats**, **beaks**, bird senses, and migration.

Questions to guide explorations and experiments

- Where do birds live? What determines where a bird lives?
- What is a habitat? What places near us could help a bird meet its habitat needs?
- What impact does meeting your habitat needs have on the needs of birds and other living things?
- What do birds eat?
- How have birds adapted to their habitats?

Books and activities

- **Books:** all about bird adaptations, migration, and finding food
- **Activities:** explore beaks, discover keen bird senses, learn about migration, and take a Bird Walk

Children's Books

Fiction

- *The Barn Owls* by Tony Johnston (Ages 4-8)
- *Coo* by Kaela Noel (Ages 9-12)
- *Gracie, The Public Gardens Duck* by Judith Meyrick (Ages 4-8)
- *Have You Seen Birds?* by Joanne Oppenheim (Ages 4-8)
- *Hoot Owl, Master of Disguise* by Sean Taylor (Ages 4-8)
- *A House for Every Bird* by Megan Maynor (Ages 4-8)
- *Just Ducks!* by Nicola Davies (Ages 4-8)
- *The Most Amazing Bird* by Michael Arvaarluk Kusugak (Ages 4-8)
- *Sylvie* by Jennifer Sattler (Ages 3-8)
- *My Tiny Life* by Ruby T. Hummingbird by Paul Meisel (Ages 4-8)
- *Two Little Birds* by Mary Newell DePalma (Ages 4-8)

Poetry

- *The Cuckoo's Haiku and Other Birding Poems* by Michael J. Rosen (Ages 4-8)
- *Today at the Bluebird Café: A Branchful of Birds* by Deborah Ruddell (Ages 4-10)

Nonfiction

- *The Bald Eagle (Welcome Books)* by Lloyd G. Douglas (Ages 4-8)
- *The Beak Book* by Robin Page (Ages 4-8)
- *Beaks!* by Sneed Collard (Ages 6-9)
- *Beauty and the Beak: How Science, Technology, and a 3D-printed Beak Rescued a Bald Eagle* by Deborah Lee Rose and Jane Veltkamp (Ages 4-12)
- *Circle* by Jeannie Baker (Ages 6-9)
- *How Do Birds Find Their Way?* by Roma Gans (Ages 4-8)
- *Paddle Perch Climb: Bird Feet Are Neat* by Laurie Ellen Angus (Ages 3-8)
- *The Real Poop on Pigeons* by Kevin McCloskey (Ages 6-9)
- *Spit Nests, Puke Power, and Other Brilliant Bird Adaptations* by Laura Perdew (Ages 4-8)
- *Thunder Birds: Nature's Flying Predator* by Jim Arnosky (Ages 6-9)
- *Tiny Bird: A Hummingbird's Amazing Journey* by Robert Burleigh (Ages 6-9)
- *Vulture View* by April Pulley Sayre (Ages 4-8)

Bird Words

Adaptations
Process of change by which a bird becomes better suited to its habitat

Auriculars
Feathers that cover the ears of a bird

Beak / bill
More than just the bird's mouth, it functions like a hand, a comb, gets food, kills prey

Binocular vision
When both eyes can focus on one thing at the same time

Carnivorous
Eating other animals

Carrion
The flesh of dead animals

Concave
Having a surface that curves inward like that of a dinner plate placed on a table

Diurnal
Active during the day

Habitat
The natural environment of a plant or animal

Migrate
To move seasonally from one area to another

Nocturnal
Active at night

Pishing
A sound humans make that may attract birds

Prey
An animal that is hunted and killed by another for food

Raptor / Bird of prey
Birds that eat other animals. Most hunt live prey (hawks, eagles, falcons, owls) but some eat dead animals (vultures)

Species
Group of living things (such as birds) with similar characteristics and are able to produce young. There are more than 9,000 bird species

Talons
The claws of a bird of prey

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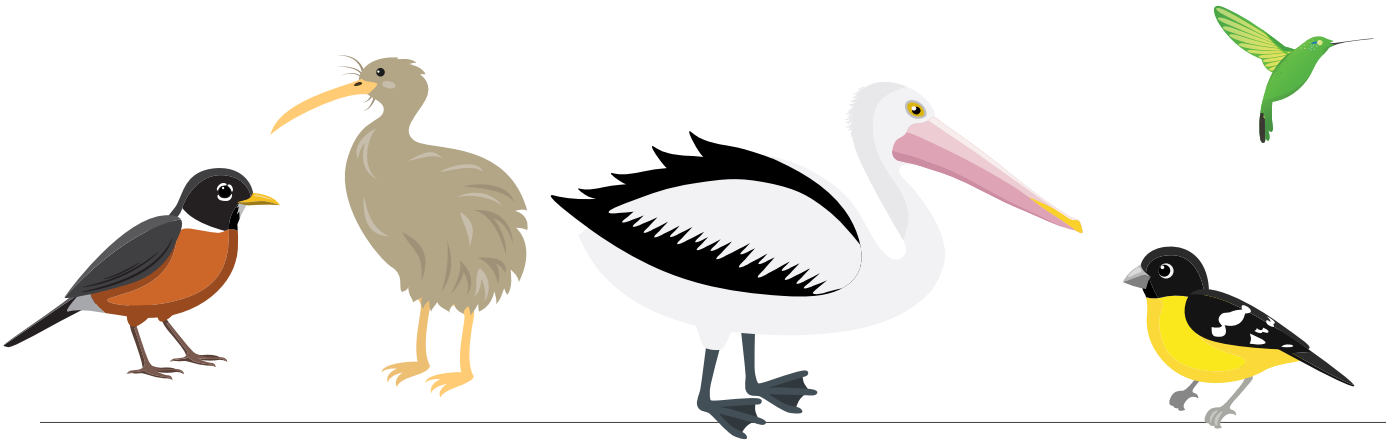
Activity 1: Eating at Home

Introduction

A **habitat** is what we call home. It's where we live. Like any home, it has to provide food, water, shelter, and space. Birds also need habitats with all these elements. Bird **species** have **adapted** to live in their habitats and to obtain the things they need in order to survive.

The **beaks**, feet, and legs of many birds are adapted to gather specific things in their environment. Help kids explore some of the adaptations that birds have made to find food in their habitats, especially birds' beaks and how they are adapted to getting particular foods.



Supplies

- Tall vase
- A pan deep enough to hold 3 inches of mud
- Large mixing bowl
- A tray about 12 inches x 6 inches
- 6 paper drinking straws (whole) plus several more cut up into 1-inch pieces
- 3 large slotted spoons
- Tea strainers or sink strainers
- 2 sets of chopsticks
- Needle-nose pliers
- Tweezers
- 2 tongs
- Packing peanuts or small pieces of balsa wood
- Dirt to cover the tray and to make 3 inches of mud in the pan
- Bag of tiny styrofoam balls or pom poms
- Rubber bands, cut into "worms"

Activity 1: Eating at Home

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Get kids thinking ...

Start by asking a couple of questions: What is a **habitat**? What is important to have in a habitat? What does your own habitat look like? (If you like, kids could draw a picture of their own habitat in their journal.) Talk about the difference between the essentials in their habitat and the nonessentials.

Have kids compare their habitats with those of birds, emphasizing the need for food, water, shelter, and space. Ask questions about each need — e.g., what is your source of food? What are the birds' sources of food? Help kids make comparisons between their needs and birds' needs and how these needs are met.

To have needs met and to survive, birds and other species have to be well adapted to their environment. Although all birds have beaks, these beaks vary in size, shape, and function. Many are adapted to particular habitats and the foods they eat. So in part, their beaks determine where birds will live, since they must find food nearby every day.

Let's get started!

Show kids these pictures of a **hummingbird**, **snipe**, **grosbeak**, **pelican**, and **robin** or some photos from a field guide (see pages 40-44). Get kids to focus on the beaks of each bird and guess what the beak could be used for and what the bird might eat. Explain how to rotate through 5 habitat stations to discover how the shape of a bird's beak is adapted for eating foods particular to where it lives.

Activity 1: Eating at Home

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Habitat Station Set Up

Step 1: Gather tools that have capabilities similar to those accomplished by birds' beaks, e.g., needle-nose pliers, tongs, straws, chopsticks, slotted spoon, and nutcrackers and set up five stations:

Woodland edge station: provide a tall vase full of water (nectar) with a slotted spoon, tweezers, and drinking straws

Marsh station: provide a pan with about 3 inches of mud with cut up straws buried in the mud with a slotted spoon and chopsticks

Lawn station: provide a dirt-filled tray with cut up rubber bands, needle-nose pliers, drinking straw, and a tea strainer

Lake station: provide a half-full large mixing bowl of water with tiny styrofoam balls floating on it, a slotted spoon, straw, and tongs

Forest station: provide packing peanuts or balsa wood, tongs, and chopsticks

Step 2: Next, kids should rotate to each station and try to pick up the "food" with each of the tools provided. (Note: Straws are not for sipping! Have kids use the straws by placing them in the water then putting their finger over the opening.)

Step 3: At each station, have them test each tool and note their results in retrieving each type of "food."

Step 4: After they have visited every station, ask them to share their ideas about which "beak" was best to get the food in each "habitat." Then have kids identify which of the birds they saw earlier have beaks similar to the kinds of tools they used to collect "food."

Identifying Beaks, Food, and Habitats

Woodland edge station: Water = nectar. Straw = hummingbird beak

Marsh station: Cut up straws = insects and larvae. Chopsticks = snipe beak

Lawn station: Rubber bands = worms. Needle-nose pliers = robin beak

Lake station: Styrofoam balls = fish. Slotted spoon = pelican beak

Forest station: Packing peanuts or small pieces of pieces of balsa wood = nuts. Tongs = grosbeak beak

Talk about which birds have beaks that are very specific to finding food. The robin and the grosbeak could probably pick up other foods.

Activity 1: Eating at Home

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Ask kids: What else do you think they might eat? The beaks of the pelican, hummingbird, and snipe are pretty specific in their function, although the hummingbird does catch insects in flight. Discuss other birds kids have seen and what they think those birds eat based on their beak type.

To see some beaks in action, watch:

Great Blue Heron Eats a Fish
https://youtu.be/mCV6Yttysgw

Pileated Woodpecker (Up Close Foraging Video)
https://youtu.be/XmDPIUrEJGQ

Amazing Giant White Pelicans (start at minute 2:34)
https://youtu.be/30JeCGVGkmg

Wilson's Snipe Eating
https://youtu.be/Z33a59T74RU

Ask kids what they've noticed about other characteristics have been adapted by birds to help them find food. For example, note that the snipe's eyes are set back farther back on its head. With his bill in the mud looking for larvae, the snipe is still able to spot danger. How about the webbed feet of ducks to move them through the water?

Conclude by giving kids some time to look through field guides to check out more beaks and to discover other habitat adaptations, such as different types of feet.

More activities

Eat Like a Bird (PBS Fetch! with Ruff Ruffman)
https://www-tc.pbskids.org/fetch/parentsteachers/activities/pdf/FETCH_EatLikeABird_AG.pdf

Whose Beak? Whose Feet? (Audubon Adventures for Young Nature Lovers)
http://www.audubonadventures.org/beaksandfeet/index.html

Bean Counter Evolution (Exploratorium's Science Snacks)
https://www.exploratorium.edu/snacks/bean-counter-evolution

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Rufous Hummingbird

2

Common Snipe

2

Evening Grosbeak

2

Pelican

2

American Robin

Activity 2: Eating Out

Introduction

When the weather changes, so do bird diets. In the winter, some birds will try to eat as many fatty foods as possible to increase body fat for additional warmth. Some, like the chickadee, will change its food preference in the winter. Instead of mainly eating insects as it does in the warmer months, it switches to seeds.

But many birds have to simply search for food elsewhere. To get food, they have to move to a different area to find the food that they need. Some 350 North American bird species **migrate** long distances every year. In this migration simulation, kids can experience some of the many natural obstacles and increasingly more human-created obstacles that birds face when migrating.

1. Migrate like a bird

Supplies

- Balloons
- Sticky notes
- Pieces of cardboard or something to use as a fan

Get kids thinking ...

Ask kids: Why do people move from one place to another? Talk about the different reasons people move. **Ask:** Why do birds migrate? What obstacles do they face in migrating?

Activity 2: Eating Out

(continued from previous page)

Let's get started!

To find food or a nesting location, birds must fly through rain storms; face tremendous winds that blow them off course; dodge tall, well-lit buildings that attract them; or deal with a housing development that was once a refueling stop. They have to face these dangers twice a year — when they leave their nesting grounds in the fall and then return to nest in the summer.

In this activity, kids will help a "balloon" bird migrate across the room or an area outside.

Step 1: Hold up an inflated balloon and explain to the kids that it represents a migrating bird (you can draw a bird on it if you like).

Step 2: Tell them they are going to help this bird migrate to its winter home and then back to its nesting grounds by batting the balloon to the next person in line and not allowing it to touch the ground.

Step 3: Have all but one of the kids lie down on their backs about 4 feet apart, heads in the same direction.

Step 4: Depending on the size of your group, give every other or every fourth child on the floor a sticky note. **Kids with sticky notes are "rest stops" for the bird and can hold it for a few seconds when it comes to them.**

Activity 2: Eating Out

(continued from previous page)

Step 6: One child stands about half way along the bird's course between two kids, near their feet, **fanning the air to simulate a storm**. If the fan blows the bird off course two times, the fanning (i.e., the storm) stops. Give the bird back to the first person in line and let fall "migration" begin again.

Step 7: When the bird reaches the last person in line, that child should catch the balloon and hold it for a few seconds before sending the bird back on its spring migration.

Step 8: After spring migration is complete, repeat the migration cycle. But this time, have some kids who were "rest stops" **get on their knees or stand up to create tall, lit-up buildings** — one of the obstacles migratory birds face every year. Start the fall migration and the storm.

Step 9: Repeat for spring migration.

Ask kids which of the two migration cycles was easier. Why? Talk about what other obstacles may interfere with birds' migration. **Then ask:** How can humans help eliminate these obstacles?

In the next activity, help kids to see that migration is exhausting and hungry work!

Audubon's national program to help provide safe passage for nocturnal migrating birds

Every year, billions of birds migrate at night, navigating with the night sky. As they pass over big cities, they can become disoriented by bright artificial lights and skyglow, often causing them to collide with buildings or windows.

The Lights Out program encourages building owners to turn off extra lighting during migration season.

Is there a Lights Out program in your city?
https://www.audubon.org/lights-out-program

Activity 2: Eating Out

(continued from previous page)

2. Flap your wings

The Ruby-throated Hummingbird migrates to Central America every winter. This hummingbird is less than
4 inches long and weighs about 1/10 of an ounce — the weight of three paperclips!

Most of these hummingbirds get to Central America by **flying nonstop 500 miles across the Gulf of Mexico in 23 hours!**

With this activity, you'll give the kids some idea of the tremendous energy that it takes to fly nonstop. Kids will flap their "wings" energetically and see how that affects their heartbeat.

Supplies

- Place to record pulse and "wing flaps"
- Pencil
- Timer

Let's get started

First, have kids practice taking their pulse. According to the Mayo Clinic, "to check your pulse at your wrist, place two fingers between the bone and the tendon over your radial artery — which is located on the thumb side of your wrist. When you feel your pulse, count the number of beats in 15 seconds."

Activity 2: Eating Out

(continued from previous page)

Next, pair up the kids. One is the hummingbird; the other will count how many times the "hummingbird" flaps its "wings."

Step 1: Set a timer for 15 seconds.

Step 2: Take the pulse of the hummingbird for 15 seconds and record the number of beats.

Step 3: Set a timer for 15 seconds.

Step 4: Once the timer starts, the hummingbirds will begin raising their hands above their heads and bringing their hands down to their sides as quickly as they can. The complete up-and-down motion counts as one flap. The counter tallies the number of complete flaps.

Step 5: After 15 seconds, the counter will say that time is up and record the number of flaps.

Step 6: Take the pulse of the hummingbird again and record the number.

Step 7: The hummingbird and the counter will swap roles and repeat this process.

Name	Pulse before flapping	Number of flaps in 15 seconds	Pulse after flapping

Explain to kids that in the same 15-second period that they flapped, a hummingbird would flap between 225 to 1200 times, depending upon the conditions it was facing, such as wind and rain. In the same 15 second period, its heart would have beat at least 315 times. **Think of how much energy these birds expend in their 23-hour flight!**

Activity 2: Eating Out

(continued from previous page)

Have the kids compare their numbers with the actual hummingbird. Then let kids refuel with a drink and snack and talk about what would prompt such a strenuous journey.

More migration activities

Migration Challenge (PBS KIDS Plum Landing)
https://pbskids.org/plumlanding/educators/activities/pdf/MigrationChallenge_FAA_Eng_Span.pdf

Migration Craft and Game Ideas Slides (The Cornell Lab)
https://docs.google.com/presentation/d/1JiUG0NOoJlIY0-lu6mibqUMV96yjlNz5DPf3FdYp1PI/present?slide=id.g7395d6a963_1_84

Migration Craft and Game Ideas Activity Guide (The Cornell Lab)

Activity 3: Hunting Prey

A bird of **prey**, or **raptor**, has excellent eyesight, powerful feet with long sharp **talons**, sturdy, partially hollow bones, and a strong hooked beak. Most hunt live prey and all are **carnivorous**. Birds of prey include hawks, eagles, falcons, owls, and vultures — though vultures lack strong, grasping feet and talons and dine on **carrion**.

Vultures also use their sense of smell to locate their food, but most other birds locate food by seeing or hearing it. A Great Horned Owl, which has no sense of smell, can prey on skunks because of this. Birds' preference for food is guided by being able to locate it and use their beaks to get it into their mouths.

Have kids test their own senses of sight and hearing against birds of prey with these demonstrations.

Supplies

- A quarter coin
- Tape measure
- Empty narrow-necked bottle
- Fine-toothed comb
- Blindfold

Get kids thinking ...

Ask kids: What do you notice about the eyes of birds of prey? Why would that be useful to birds of prey? What do they think when they hear: "*Eyes on the front, ready to hunt. Eyes on the side, ready to hide.*"

Binocular vision is when both eyes can focus on one thing at the same time. Birds of prey, especially eagles, have amazing long-distance vision and can use both monocular and binocular vision. Eagles can see perfectly clearly about ***eight times as far*** as people can, allowing them to spot and focus on even small prey animals that are two to three miles away.

Activity 3: Hunting Prey

(continued from previous page)

Let's get started

Find out how eagled-eyed kids are!

Step 1: Take kids outside to a large space, such as an empty parking lot, playground, or sidewalk where it is safe for everyone to stand.

Step 2: Have the kids turn their backs to you and place a quarter on the ground — don't let them know where you put it.

Step 3: Have everyone walk about 25 feet or so away from the quarter and then have them turn around and ask if they see anything on the ground back where they were first standing.

Step 4: In twos or threes, have kids walk toward the quarter and when they see the quarter, have them stand in that spot. Measure the distance and multiply it by 8. **That's about how far away an eagle would be able to see the quarter!**

Activity 3: Hunting Prey

(continued from previous page)

Nobody says "eagle-eared," but this doesn't mean eagles have poor hearing.

Birds of prey like eagles and hawks that are **diurnal** (active during the day) do use their hearing to locate prey or other birds, but it's not as essential as it is for owls, which locate their prey in the dark only by sound.

Show kids a picture of a Great Horned Owl

Ask: What are those tufts sticking up on its head? Where are the bird's ears?

Birds' ears are funnel-shaped openings located below and somewhat behind their eyes. They do not have outer ears and their ear openings are covered by soft feathers called **auriculars**, which help protect the ears and help keep the sound of rushing wind out.

Give kids an idea of how this works:

Step 1: Get a narrow-mouthed bottle and blow over the opening. What happens?

Step 2: Next, hold a fine-tooth comb over the mouth of the bottle and blow through the comb. What happens? The teeth of the comb act like the soft feathers covering the ear openings and cut down on the noise.

Some owls, especially those who hunt at night, have one ear opening higher than the other and rely on their hearing to locate prey. Depending upon where the sound is coming from, the sound will be louder in one ear than the other. This difference helps the owl pinpoint where the sound originates.

Activity 3: Hunting Prey

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That's not all that helps owls' hearing. Point out pictures of owls from your field guide and have them note their **concave** faces (like the Barn Owl at right). This face shape helps them funnel sound into their ears.

Help kids understand how this works:

Step 1: Pair them up and have them stand about 6 feet apart.

Step 2: One at a time, have them whisper to each other.

Step 3: Now have them cup their hands behind their ears and use the same whisper voice again.

Ask: Which way sounds louder? Why? Their cupped hands act like the curve of the owl's face and direct the sound to their ears.

Demonstrate how important hearing where prey is located is to an owl:

Step 1: Blindfold one child and have the others stand in a circle about 10 feet back around them.

Step 2: Choose one child to go up quietly as possible and tap the blindfolded "owl" on the shoulder.

If the blindfolded child is able to detect the "prey" before he is tapped, the "prey" has to take the place of the "owl" and is blindfolded.

Activity 3: Hunting Prey

(continued from previous page)

More hunting activities

Predator Vs. Prey Games to Play With Kids (Sciencing)
https://sciencing.com/predator-vs-prey-games-to-play-with-kids-12748126.html

Raptor Study (New Jersey Division of Fish and Wildlife)
https://www.nj.gov/dep/fgw/pdf/raptrpln.pdf

Raptors! The Birds of Prey Audubon Adventures Activity Guide
http://www.audubonadventures.org/docs/AA_Raptors_final.pdf

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Great Horned Owl

BIRD WALK

On this Bird Walk, encourage kids to pay particular attention to beaks, claws, and feeding behavior in the birds they observe.

This includes spotting other signs of birds, e.g., tracks, poop, and nests.

You can also introduce **pishing** — a sound Bird Buddies can make to attract birds' attention and get them to show themselves. To produce the sound, put a "p" in front of a long version of the "sh" sound you make when you want people to be quiet. Repeat this sound quickly over and over. Birds may respond to the sound and come in for a closer view of what is producing it, giving kids a closer view of beaks and claws. If a bird comes in close, after everyone has had a good look at them, stop pishing.

Sometimes pishing works, sometimes it doesn't. Check out videos of phishing so kids can see it in action and let them practice making the pishing sound before you head out for the walk.

Watch

Pishing for Birds
https://youtu.be/Eba0M9AOgRo

Pishing
https://youtu.be/34E2EsVkDqg

Writing About Birds

Bird houses

Have kids select a bird that fascinates them and find out more about its habitat. Does it nest in shallow scrape, a burrow, or tree hollow? Tell kids to take the point of view of their bird and write a one-page descriptive essay using specific details and rich language to describe your nest, where it is, and why it's perfect for you. Kids can include a drawing, too!

Habitat map

Have kids visit a nearby outdoor space to map (a yard, garden, local park) and spend time observing what is there. Get them to take notes on what they see, noting all the different trees, flowering plants, shrubs, grass, etc., as well as water and food sources. After an initial survey of the yard, kids can draw and label a map of the space and use it to track how the space is being put to use as a habitat for wildlife or to advocate for improving the space for birds and other wildlife.

Make a Habitat Mapping Game (PBS Parents)
https://www.pbs.org/parents/crafts-and-experiments/make-a-habitat-mapping-game

Eagle-eyed hero

Offer this prompt to kids: If you swapped your eyes for an eagle's, what would you do with your incredible vision? Encourage kids to research all the characteristics of the eagles' eyes and incorporate some of those facts into a superhero tale.

Bird ads

Have kids help birds find the best places to stop and rest during a migratory flight. Have them get creative and write an advertisement for birds that promotes a good place for birds to stop or stay during migration. Kids can research a real place or use their imaginations to conceive the ideal location. But they should make sure birds who read this ad can find out all the details about the food, water, and shelter that are available to them.

Writing About Birds

Figures of speech

Ask kids: If someone says, "You eat like a bird," did you actually have a meal of bugs or seeds? Very likely not! Explain that these figures of speech are idioms, expressions that have meanings beyond the actual words used in the phrase. To eat like a bird means to not eat very much or peck at your food. Have kids come up with and research more idioms and expressions about birds and their behavior. Here are a few to get kids started:

As the crow flies ..... shortest distance (in a straight line) between two points

Lame duck..... a politician who is leaving office or someone no longer effective

Talk turkey..... to talk seriously, usually about making a deal

A little bird told me ..... not telling where you got some information

Wild goose chase ..... a search that ends up with nothing found

When the kids have a good list of idioms and meanings, have them illustrate some of their favorite expressions using a literal interpretation, which means to create a drawing based on the exact wording of the expression.

Ask them to put the expression in a sentence, such as "*My friend Juana eats like a bird,*" and draw Juana pecking insects off a tree or pulling a worm out of the ground with her mouth. They should add the definition of the idiom to their illustration.

Compile all the illustrations into a book of idioms and share it with other birds of a feather!

Kid-friendly Digital Media

Websites

Beaks (Project Beak)
http://projectbeak.org/adaptations/beaks.htm

Fine Feather Feast Game (PBS KIDS Nature Cat)
https://pbskids.org/naturecat/games/fine-feathered-feast

Hunter and Hunted Game (Audubon Adventures)
http://www.audubonadventures.org/hunterhunted/index.htm

Guess Who's Coming to Dinner (Texas Parks and Wildlife)
https://tpwd.texas.gov/kids/wild_things/birds/bird_bills_quiz1.phtml

BirdCast
https://birdcast.info/

Educational apps

Sherlock Bones
https://sherlockbonesmystery.com/

https://apps.apple.com/us/app/sherlock-bones/id1556348159

https://play.google.com/store/apps/details?id=com.RSMG.SherlockBones

Videos

Bird Feeding Adaptations: How Beaks are Adapted to What Birds Eat (Cornell University's Naturalist Outreach)
https://youtu.be/i1BCehbUsTQ

How Sharp Are an Eagle's Eyes? (NOVA)
https://www.pbs.org/wgbh/nova/video/sharp-eagle-eyes/

Barred Owl Bird Cam (The Cornell Lab)
https://www.allaboutbirds.org/cams/barred-owls/

FeederWatch Cam (The Cornell Lab)
https://www.allaboutbirds.org/cams/cornell-lab-feederwatch/