



LESSON OBJECTIVE

- Understand adaptations of birds

GRADE

- 4

STANDARDS

- Life Science
- ELA

TIME REQUIRED

- 45-60 min

VOCABULARY

- Adaptation

MATERIALS

- Student Worksheet
- Crayons/colored pencils
- “Bird food” items: water in a cup, walnuts in shell, pinecone, rice, rubber bands, dirt, Styrofoam cup, jerky
- “Bird tool” items: straws, nutcrackers, tweezers, needle nose pliers, fish tank nets, scissors

RECOMMENDED ASSESSMENT

- Bird drawings and labels

Introduction

Students will learn the characteristics of birds that separate them from other types of animals, understand how birds have adaptations that allow them to eat certain foods, and then design their own bird to fill a specific place in an ecosystem.

State Standards

4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Optional Reading Extensions:

4.RC.5: Determine the main idea of a text and explain how it is supported by key details; summarize the text.

4.RC.9: Combine information from two texts on the same topic in order to demonstrate knowledge about the subject.

Lesson Plan

Background Knowledge –

- Adaptation:** a physical or behavioral trait the animal has to help it survive. This can also be thought of as a change or the process of change by which an organism or species becomes better suited to its environment over time.
- Onomatopoeia:** the creation of a word that phonetically imitates or suggests the sound that it describes (ex: oink, meow, roar, chirp)

Activity –

1. Is it a Bird?

- Begin by asking students what they think makes a bird a bird. If someone says wings, challenge them to think of an animal with wings that wouldn't be considered a bird (like a fly or a ladybug).
- Come up with a list of bird characteristics and write these on the board. A bird has: feathers, hard-shelled eggs, hollow bones (like a paper towel tube), a beak, two feet, and two wings.
- Quiz students:
 - Is an ostrich a bird? Why or why not? (Yes)
 - Is a bat a bird? Why or why not? (No feathers, doesn't lay eggs, no beak)
 - Is a penguin a bird? Why or why not? (Yes)
 - Is a flying squirrel a bird? Why or why not? (No feathers, doesn't lay eggs, no beak)
 - Is a butterfly a bird? Why or why not? (No feathers, no beak)




2. Beak Bonanza

- a. Humans can eat a wide variety of foods and we are able to invent tools based on what we see in nature that make it easier for us to eat those foods. Ask students: what would be the best tool for eating...
 - i. Gummy worms (pinch two fingers together)
 - ii. Chicken noodle soup (spoon)
 - iii. Jerky (use your teeth to rip it or scissors to cut it)
 - iv. Mixed berries (fork)
 - v. Juice (straw)
- b. Can we eat soup with a fork? Can we drink juice with our fingers? No! Birds are the same way! Birds evolve based on what food is available in their habitat, and their beaks are perfectly shaped to obtain the food they eat. We call these **adaptations**. Birds use their beaks as spears (kingfishers), chisels (oyster catchers), hammers and drills (woodpeckers), strainers (flamingos), and scoops (spoonbills), just to name a few. We're going to test this.
- c. Each group of students will need a set of the bird pictures at the end of this lesson as well as the following food and tool items:

Food Item	Tool	Bird Picture
Nectar (water in a cup)	Straw/pipette	Hummingbird
Kidney beans	Clothespin	Toucan
Pinecone with raw rice sprinkled into it (simulates bugs deep in the tree bark)	Tweezers	Woodpecker
Rubber bands or cut up yarn buried in dirt (simulates worms)	Needle nose pliers	Robin
Floating fish (try making some with a Styrofoam cup or plate)	Fish tank net or slotted spoon	Pelican
Jerky	Kid scissors	Eagle

- d. Have the items mixed up. Each student should try each tool on each food item to see if they can figure out as a group which tools work best to obtain each type of food.
 - e. If a bird had a beak that looked like a clothespin or a pair of tweezers, what would that beak look like? Can they match the bird pictures to the food they eat based on which tool works best for that food?
 - f. Encourage kids to try all the "right tools" with the right foods. Then try using them with the wrong things if they haven't already. Can a hummingbird crack open a nut? Never. Can a pelican catch bugs hiding in the bark of a tree? Nope. Why not? An animal has to have the right features to eat the foods in their habitat and survive.
3. Build-a-Bird
- a. Pass out student worksheets. Each student is going to design their own perfect bird. Have students look at the bird beak examples (project these on the board) and decide what they want their bird to be able to eat. What does their beak need to look like?

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- A decorative border in the top right corner consists of various colorful icons including paw prints, fish, and circles in shades of blue, green, yellow, and purple.
- b. Birds are more than just beaks! Let's give our bird some other parts. What else do birds have? (Recall from Activity 1: two feet, two wings, feathers) Talk students through the other parts of a bird and how they are going to build their bird.
 - i. What do birds use their feet for? Bird feet can be clawed and used to stand on perches. Some birds like chickens use their feet to scratch at the ground while birds like parrots use their feet to hold food. Others, like birds of prey (hawks, owls, eagles), use their claws to hold down prey while tearing it with their beak. Some birds have webbed feet perfect for swimming! What do they want their bird's feet to be able to do?
 - ii. Owls have feathers that are serrated so they can fly silently through the night. Parrots have brightly colored feathers that help them attract a mate. Penguins have very short feathers closely spaced to help them stay warm and dry. What type of feathers does your bird need for where it is going to live?
 - c. Have students come up with a sound their bird makes. Can they try and write the sound using the alphabet? We call this an **onomatopoeia**! Ex: "purty purty" or "pippety chee" or "piddy weeee".
 - d. What color is your bird so that it can blend into its surroundings? Is it brightly colored? Does it have any other features to help it stay safe from predators? For example, many birds have very large eyes compared to the size of their head because they have really good eyesight. If humans had eyes as big as an owl, our eyes would be the size of baseballs! How big do you want your bird's eyes to be?
 - e. Be sure to name your new bird species and have students draw and label their bird with its special adaptations that help it survive.

Post Activity Wrap Up –

Each bird's beak is perfectly adapted to the food that's available in their habitat. What would happen if a bird went somewhere that wasn't perfect for them? Have students talk to their table groups about their bird and where it lives. Can any of the other birds that were created in their group survive there too? What does their bird have that would be useful in that habitat?

Discover Further

Extending the Lesson –

Have students explore the Project Beak website at projectbeak.org/adaptations/beaks.htm to learn more about the adaptations of birds, including their internal organs and senses, and build a virtual bird. The site also contains links to nest cams where the kids can watch birds in action!

Learn More –

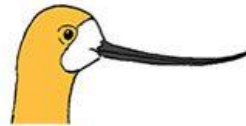
The Fort Wayne Children's Zoo is home to more than 30 different types of birds. Learn more about them and their special adaptations at kidzoo.org/our-animals/.

Resources

For an ELA connection, read [Unbeatable Beaks](#) by Stephen Swinburne (ISBN-13: 978-0805048025) or [Beaks!](#) by Sneed B. Collard III (ISBN-13: 978-1570913884).



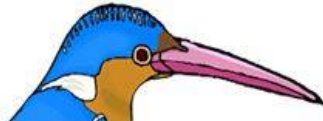
Flamingo
Filter Feeding



Avocet
Mud Probing



Vermillion Flycatcher
Insect Catching



Kingfisher
Aerial Fishing



Pelican
Dip Netting



Woodpecker
Chiseling



Chicken
Grain Eating



Toucan
Fruit Eating



Parrot
Coniferous Seed Eating



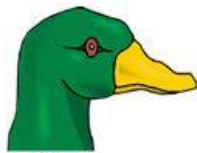
Hummingbird
Nectar Feeding



Black Skimmer
Surface Skimming



Eagle
Raptorial



Duck
Water Foraging



Ibis
Mud Foraging



Heron
Pursuit Fishing



Creeper
Tree Probing



Spoonbill
Water Shovelling



Perching bird
(cardinal)



Grasping bird
(woodpecker)



Raptor
(bald eagle)



Swimming bird
(duck)

Winging It!

Birds have different kinds of wings for different kinds of flying.
Here are three common shapes:

High-Speed Wings



CHARACTERISTICS

long
narrow
pointed
swept back

Soaring Wings



long
broad
wing slots

Maneuvering Wings



short
rounded
broad
wing slots

STRENGTHS

Fast for pursuing
prey on the wing in
the open air

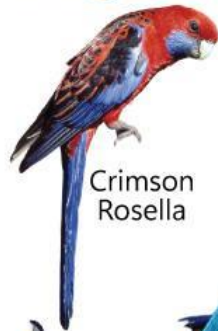
Most lift for soaring
high in the air on
thermals

Powerful for vertical
lift-off, short for
maneuverability



COLORful Birds

Animal Spot



Crimson Rosella



Anna's Hummingbird



Resplendent Quetzal



Curl-crested Aracari



Scarlet Macaw



Indian Peafowl



Blue-and-yellow Macaw



Red-bearded Bee Eater



Mandarin Duck



Red-bearded Bee Eater



Rainbow Lorikeet



Toco Toucan



Painted Bunting



Golden Pheasant



Common Kingfisher



Splendid Fairy Wren



Keel-billed Toucan



Gouldian Finch



Paradise Tanager



Wilson's Bird-of-Paradise



Lilac-breasted Roller



Costa's Hummingbird



Sun Conure





Build-a-Bird





Student Worksheet

Name: _____

Design your perfect bird!

What does your bird eat and what does their beak look like?

What does it use its feet for?

What do its wings look like?

Where does your bird live?

What sound might your bird make?

How does your bird protect itself from predators (does it camouflage)?

What is your bird species called?

Draw your bird and label your bird's special adaptations that make it unique!