Teacher Guide

UNIT 2 LESSON 3:
BEAKS

Theme

A bird's beak is an essential tool for the bird's survival. The shape of a bird's beak can help us not only identify which group the bird belongs to, but also what it might eat.

Missouri Science Standards: LS1.B.1; LS4.B.1; LS4.C.1

Vocabulary

Beak - Also known as bill, is a type of mouth with a hard covering made of keratin; birds use their beak to drink, to capture and gather food for themselves and their young, for preening, mating, and building nests. Beaks can also be used to attract mates, or as a weapon for defense.

Upper mandible - Upper part of the beak that is fixed in the skull.

Lower mandible - Lower part of the beak, can move independently, on a hinge like our jaw.

Specialist – A species that has a more limited diet and stricter habitat requirements. These species are well adapted to a specific habitat and/or food source that other species have trouble accessing. For example, beaks of specialist birds have evolved to catch a specific prey or eat a specific type of food that would be difficult to catch without that specific beak shape. These include birds like hummingbirds, pelicans and American Woodcocks.

Generalist – A species that can feed on a variety of things and thrive in various environments. For example, a bird that has a bill designed for eating more than one type of food. This may help them be more resilient because this helps them to adapt their nutrition and behavior to different environments. These include birds like crows, robins, and mockingbirds.

Common Misconceptions to Watch Out For:

- Birds have teeth in their beaks. Birds do not have teeth, although some do have lamellae that may look like teeth.
- All birds eat seeds. The type of food a bird eats is dependent on the shape of its bill.

Video 1: Bird Beaks Webinar

Video Description: This webinar is the perfect introduction to the diversity of the bird world as a bird's beak is not only a tool they use for pretty much everything, but is also the first key feature to look for when identifying a species. In the webinar, we cover structural adaptation, generalists vs. specialists, and even a bit of evolution. All examples are birds that live in Missouri. Video is made by Missouri River Bird Observatory.

Video Link:

Teacher Notes:

- Video serves as a good overall introduction to the lesson. However, many of the same concepts are covered again in Videos 2&3. Therefore, if short on time, this webinar may be skipped.

Follow- up Questions:

1. Fill in the blank. The outside of a bird's bill is made of _____, the same thing our fingernails are made of.
2. True or False? Birds of prey have sharp, hooked beaks.
3. True or False? All birds can crack seeds with their beak.

Video 2 and Video 3 - My Beak Can Tell You What I Eat

Video 2: Evolution by Natural Selection - Darwin's Finches

Video description: This video talks about Charles Darwin's studies of the Galapagos finches and the theory of natural selection. Video made by FuseSchool

Video link: https://youtu.be/s64Y8sVYfFY

Video 3: Bird Feeding Adaptations: How Beaks are Adapted to What Birds Eat

Video description: This video talks about the remarkable diversity of bird feeding adaptations. Video made by Cornell University Naturalist Outreach.

Video link: https://youtu.be/lFZ8NMBDCJw

Follow-Up Questions for Videos 2&3

1. True or False? When studying the Galapagos Finches, Darwin and Gould noticed that they were all slightly different than the mainland species and different from each other.
2. Fill in the blank. The differences between the finches were attributed to the _____ sources available on the various islands of the Galapagos.
3. True or False? The study of the Galapagos Finches led to the development of the theory of evolution by natural selection.
4. Fill in the blank. Birds that are seed eater specialists have _____ shaped beaks, which gives them the power they need to crack open the seeds.
5. True or False? Herons and other wading water birds only rely on their long, pointed beaks to be able to catch fish and live in the water.

Activity: Create Your Ultimate Bird!

Activity Summary: Students will be asked to individually create their own bird with adaptations to reflect what and how they eat, where they live and move, and how they take advantage of their surroundings through their adaptations.

Teacher Notes:

- *It is important that the students plan their bird's lifestyle BEFORE they go to sketch what the bird looks like. This will help them better understand adaptation.*
- *It is also fun to have the students name their bird and maybe even come up with what the bird might sound like. We recommend having the students come up with their bird's sound AFTER completing Lesson 4: Bird Language so they are more familiar with the various sounds birds make.*

Concluding Questions/Assessment

*Student worksheet included in packet.

1. How does a bird's beak shape help it survive and reproduce in its environment?
2. Describe two beak shapes and what food a bird with that beak shape might eat.
3. Describe the difference between a specialist and a generalist. Give examples of each.
4. What was the most challenging part of creating your Ultimate Bird? Why?