

Teacher Guide: Hide and Beak

Concepts:

- Animals, including birds, have physical adaptations for their ways of life.
- We can often infer what a bird eats from the size and shape of its beak (bill).

Learning objectives:

- Students will learn about the relationship between a bird's anatomy—particularly its beak size and shape—and its diet. This is an excellent example of the principle of “form fits function” that occurs throughout biology.
- Students will learn the names of at least seven birds commonly found in Texas.
- Students will examine the different habitats represented in the Hall of Texas Wildlife.

TEKS: Grade 3-5

§112.14.10A, 15.10A, 16, A. 4C, B. 2D, 9A, 10A (5th grade STAAR Readiness Standard)

Location: Hall of Texas Wildlife (3rd Floor)

Time: 10-15 minutes

Supplies:

- Worksheet (There are two versions; the simpler version does not require writing names.)
- Pencil
- Clipboard

Vocabulary: *raptor, bird of prey, generalist, probing, chiseling, dip-netting* (many of the vocabulary terms to describe birds' eating behaviors may be unfamiliar to students, but they can use context clues to find the answers to the worksheet), *bill vs. beak* (these two words are interchangeable)

Pre-Visit:

- Review vocabulary that students will use in the worksheet, including types of birds and their feeding behaviors
- Review basic bird anatomy

Post-Visit Classroom Activities:

- Have students complete the Hide and Beak Review as a classroom activity or for homework.
- Have students review what they learned by sharing their favorite birds from the museum and discussing how these birds live.
- Assign students a research project on five common birds of Texas, including their names, ranges, habitats, feeding behaviors, and mating behaviors (see the List of Birds on the 3rd Floor for suggestions). The Cornell Lab of Ornithology website (www.allaboutbirds.org) is an excellent resource for learning about North American birds' life histories. Additionally, check field guides such as Peterson, Kaufman, National Geographic, or Sibley for information and images.

List of Birds on 3rd Floor

The Hall of Texas Wildlife (3rd floor) includes the following birds:

- Rio Grande Turkey
- Canyon Wren
- Red-tailed Hawk
- Turkey Vulture
- Black-bellied Whistling Duck
- White-tailed Hawk
- Mourning Dove (located in Oak Woodlands region, no ID card)
- Chihuahuan Raven (located in Puma case, no ID card)
- Northern Mockingbird
- Attwater's Greater Prairie Chicken
- Crested Caracara
- Pileated Woodpecker
- Burrowing Owl
- Barn Owl
- Golden Eagle
- Cliff Swallow
- Greater Yellowlegs
- Lesser Yellowlegs
- American Avocet
- Long-billed Curlew
- Black-necked Stilt
- Willet
- Scaled Quail
- Greater Roadrunner
- Green-winged Teal
- Wood Duck
- White Pelican
- Laughing Gull
- Herring Gull
- Ring-billed Gull
- Royal Tern
- Northern Jacana

Hide and Beak

The shape and size of birds' beaks can tell us a lot about what and how birds eat. How many of the examples of the following bird beaks can you find in the Hall of Texas Wildlife (3rd floor)? Whenever you find a bird with one of the beaks below, write its name in the space next to the picture.



Generalist

Beaks of medium length and thickness can have many uses, such as cracking seeds, catching insects, or eating fruits.

Example(s): _____



Probing

Very long, tubular beaks, curved slightly downward, are used by shorebirds for probing into sand or mudflats to find small invertebrate animals buried in sediment.

Example(s): _____



Chiseling

Straight, sturdy beaks are used by woodpeckers and sapsuckers to chisel through tough tree bark.

Example(s): _____



Dip netting

Extremely long beaks with large pouches are used like nets to catch whole fish while diving underwater!

Example(s): _____



Insect catching

Short, pointy, beaks—flat and wide when viewed from above—are used for gleaning insects off of bark, leaves, and plants, or catching insects in the air.

Example(s): _____



Raptorial

Large, hooked beaks are used by raptors (birds of prey, such as hawks and eagles) to kill live prey and then rip off pieces small enough to swallow whole.

Example(s): _____



Seed eating

Beaks that are pointed, short, and thickly cone-shaped are used to crack open nuts and seeds.

Example(s): _____

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Generalist

Beaks of medium length and thickness can have many uses, such as cracking seeds, catching insects, or eating fruits.

Examples: Northern Mockingbird, Chihuahuan Raven (located in Puma case, no ID card), Laughing Gull, Herring Gull, Ring-billed Gull



Probing

Very long, tubular beaks, curved slightly downward, are used by shorebirds for probing into sand or mudflats to find small invertebrate animals buried in sediment.

Examples: Greater & Lesser Yellowlegs, Long-billed Curlew, Willet, Black-necked Stilt (Note: American Avocet is incorrect because it has a long upward curved beak; it skims the surface of the water, rather than probing for food)



Chiseling

Straight, sturdy beaks are used by woodpeckers and sapsuckers to chisel through tough tree bark.

Examples: Pileated Woodpecker



Dip netting

Extremely long beaks with large pouches are used like nets to catch whole fish while diving underwater!

Examples: American White Pelican



Insect catching

Short, pointy, beaks—flat and wide when viewed from above—are used for gleaning insects off of bark, leaves, and plants, or catching insects in the air.

Examples: Cliff Swallow



Raptorial

Large, hooked beaks are used by raptors (birds of prey, such as hawks and eagles) to kill live prey and then rip off pieces small enough to swallow whole.

Examples: White-tailed Hawk, Red-tailed Hawk, Golden Eagle, Crested Caracara, Burrowing Owl, Barn Owl



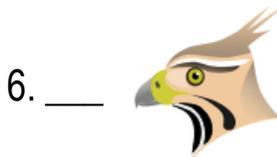
Seed eating

Beaks that are pointed, short, and thickly cone-shaped are used to crack open nuts and seeds.

Examples: Scaled Quail, Attwater's Greater Prairie Chicken

Hide and Beak Review

Adaptations such as beak size and shape allow birds to survive on specific sources of food. Write the letter of the feeding behavior from the list on the right on the line next to the beak it matches. You will not use all the feeding behaviors in the list.



Feeding Behaviors

- a. Dip-netting
- b. Scavenging
- c. Raptorial
- d. Insect catching
- e. Seed eating
- f. Generalist
- g. Probing
- h. Nectar drinking
- i. Chiseling
- j. Filter feeding

8. To the right is a picture of an adult Turkey Vulture, a common bird throughout the United States. You may have seen them flying over your school or home.

a. Which beak from the pictures above is most similar to the Turkey Vulture's?

b. How is it similar to the Turkey Vulture's beak?

c. How is it different from the Turkey Vulture's beak?

d. Make an educated guess. What kind of feeding behavior do you think the Turkey Vulture has? (Hint: It's in the list of feeding behaviors above.)



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8. To the right is a picture of a Turkey Vulture, a common bird throughout the United States. You may have seen them flying over your school or home.

a. Which beak from the pictures above is most similar to the Turkey Vulture's?

C, The raptorial beak. (Students may chose another answer as long as they justify their reasoning)

b. How is it similar to the Turkey Vulture's beak?

It has a hook on the end.

c. How is it different from the Turkey Vulture's beak?

The raptorial beak is larger. (Students may also notice that the vulture lacks feathers on its head.) This is not a beak feature but is an important characteristic of vultures.

d. Make an educated guess. What kind of feeding behavior do you think the Turkey Vulture has? (Hint: It's in the list of feeding behaviors above.) Scavenging



Hide and Beak

How many of the different types of bird beaks can you find in the exhibits in the Hall of Texas Wildlife (3rd floor)? Whenever you find a bird with one of the beaks below, circle its picture. Not all the beak types can be found in the museum.



Generalist



Insect catching



Seed eating



Coniferous-seed eating



Nectar feeding



Fruit eating



Chiseling



Dip netting



Surface skimming



Scything



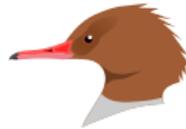
Probing



Filter feeding



Aerial fishing



Pursuit fishing



Scavenging

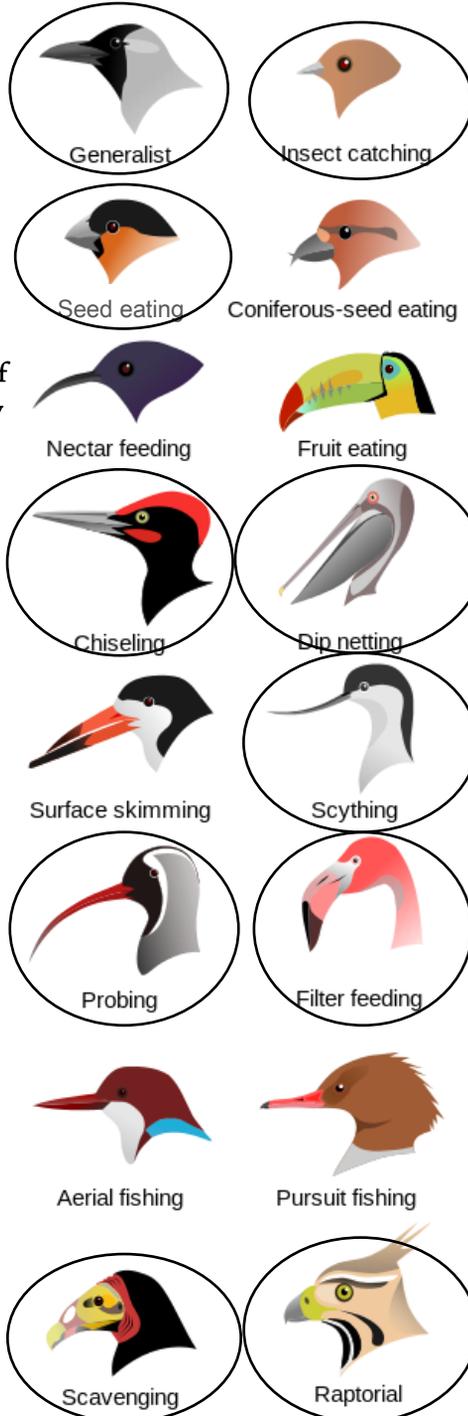


Raptorial

Images not to scale. Wikimedia Commons, L. Shayamal

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Note: Students may confuse wrens as nectar feeders, because of their thin, decurved bills, but they are mainly insect eaters

Note: Filter feeding will be the most difficult feeding type for students to locate in the museum. Many ducks (“dabbling ducks”) including the ducks on display, are filter feeders. Their bills look different from flamingos’ but both have specialized structures for straining food from the water.

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